THE IRON TRADE REVIEW

Volume XLVI | CLEVELAND, JUNE 9, 1910 | Number 23

RAILROAD BUYING

NOT ENTIRELY STOPPED BY RATE CONTROVERSY

And Better Feeling Prevails in General Market—Pig Iron Production Decreases at a Moderate Rate.

The controversy concerning freight rate advances had a chilling effect on the market for a few days, but much better feeling has prevailed since it has become known that the settlement of the issues involved has been postponed until the passage of the railway bill, now pending in congress. It is probable that railroads will place their orders rather cautiously until after the Interstate Commerce Commission renders its decision, but car orders of the past week made a rather encouraging showing.

Pig Iron Production

Pig iron production for May amounted to 2,374,802 tons, a loss of 102,898 tons compared with April. The average daily production for May was 76,607 tons, compared with 82,590 tons in April. In May, 10 merchant stacks and four stacks of steel works were blown out, and one merchant stack was banked, but two merchant stacks were lighted the first week in June. The production is still extremely heavy, being greater than at any time during the year 1907, and it seems probable that a further curtailment will be necessary to give stability to the market, in which prices are now very irregular.

Pig Iron Sales

The buying of pig iron has continued in eastern markets, in rather large volume, but price concessions have been freely made. Consumers of basic in St. Louis territory purchased about 25,000 tons and an interest at Sharon, Pa., has purchased 18,000 tons of Bessemer and malleable. The Westinghouse Air Brake Co. has purchased 15,000 tons of foundry and gray forge at about $14.50, valley, for No. 2 foundry. On an inquiry for 5,000 tons from a boiler manufacturing concern at Barberton, O., a quotation of less than $15, valley, for No. 2 foundry was made, but the order was not placed.

Railroad Buying

Despite the unfavorable view of the business situation professed by some of the railroads over late developments at Washington, a fair aggregate of pending car orders was closed last week. The Grand Trunk railroad has ordered 1,000 all steel hopper cars and 1,500 steel underframe box cars from the Canadian Car & Foundry Co., and 500 steel frame box cars from the Siliker Car Co., another Canadian interest. The Baltimore & Ohio has placed 1,000 box cars with the South Baltimore Car & Foundry Co., and will take proposals Friday on 5,000 box cars and next Monday on 2,000 steel coke cars. The St. Louis & San Francisco has ordered 500 box cars and is figuring upon 500 additional cars. The Carolina, Clinchfield & Ohio is inquiring for 250 box cars and 100 additional stock cars, and M. A. Hanna & Co. are figuring upon 500 steel ore cars.

Structural Contracts

It is estimated that structural contracts now pending in the country amount to about 175,000 tons, of which not a large part is from the railroads. The American Bridge has taken 6,000 tons for the new Ford City, Pa., plant of the Pittsburg Plate Glass Co.; 2,500 tons for a foundry for the General Electric Co. at Erie, Pa.; 1,300 tons for the DuPont building addition at Wilmington, Del., and 500 tons for a theater at Seattle. Other contracts include, the Heisen building, Chicago, 5,000 tons, to the Modern Steel Structural Co., Waukesha, Wis.; the Nickel Plate railroad, 1,900 tons to the King Bridge Co., Cleveland; the Big Four railroad, 1,500 tons to the McClintic-Marshall Construction Co.; the Toledo & Ohio Central railroad, 500 tons to the Toledo-Massillon Bridge Co.; a smelting plant, at Clino, Utah, 2,500 tons to the Minneapolis Steel & Machinery Co.; Solvay Process Co., Detroit, 1,050 tons to the Phoenix Iron Co.; Lawrence building, Boston, 11,000 tons, and an addition to the custom house, Boston, 400 tons, to the New England Structural Steel Co.; Wells Fargo Express Co., 1,600 tons, for two buildings in Chicago, to independent shops; two motor car companies in Detroit, 1,000 tons to independent fabricators. Mitre gates for the Isthmian Canal, on which bids will be opened June 15, will require 58,000 tons of steel, of which 40,000 to 42,000 will be plates and the remainder structural shapes. Steel barges, which the American Bridge Co. will build for the National Tube Co., will require 4,000 tons of plates.

Finished Material

The Jones & Laughlin Steel Co. has made its first shipment of black tin plate from its new plant at Aliquippa, Pa., where 12 mills are now in operation. The leading interest is now operating its Shenango plant of 30 mills for the first time in a number of years. Inquiries are pending for several important new gas lines, which will require a large tonnage of pipe and the steel line pipe market is in much better condition than it was a month ago. Prices on wire products are being maintained with difficulty.

Iron Ore

Eastern furnaces have purchased 20,000 additional tons of foreign ore to be brought across the Atlantic, and 15,000 tons of Nova Scotian ores. The movement of Lake Superior ore for May made a new record for that month, the total being 6,081,358 tons, making the movement to June 1, 7,601,665 tons, an increase of 4,292,597 tons over last year.

Coke

The announcement that three of the largest independent interests in the Connellsville coke region are to be merged, and that other companies may enter the combine later, has had the effect of making the coke market somewhat firmer, but no important contracts have been closed. Furnace interests whose contracts expire Jan. 1 do not seem to be anxious to enter the market at the present time.

THE WEEK IN IRON CENTERS

PITTSBURG.

Buyers Very Cautious—Several Large Structural Contracts.

Office of THE IRON TRADE REVIEW, 510 Park Building, June 7.

Buyers are showing the utmost caution in placing orders and the condition of the local iron and steel trade shows no improvement. While the controversy between the government and the railroads regarding higher freight rates, except perhaps in one or two instances, has not resulted in any cancellations, it has checked buying on the part of the carriers for the present at least. Business in most cases is confined to meeting immediate demands and there is a lack of forward buying. In several lines, prices are being maintained with difficulty and in other branches producers are making prices according to their needs.

It is expected that some official announcement will be made this week regarding the usual summer shutdown at some mills on July 1. In some cases, mills will be idle for a brief period—until necessary repairs are made. A few mills have already been closed. In certain quarters, anxiety is felt as to what will be done regarding wage scales which will expire this month. So far, no new scales have been announced.

Buying of large steel pipe continues heavy. Prices of steel bars are firm and mills are assured steady operation for some time. Slight shading of prices on plates, structural steel, wire products and sheets is noted in certain quarters. The American Bridge Co. has taken the contract for the new Ford City, Pa., plant of the Pittsburg Plate Glass Co., which will require upwards of 6,000 tons of steel and a contract for the General Electric Co.'s buildings at Erie, Pa., which will involve about 2,500 tons.

A Sharon, Pa., castings company has closed for 18,000 tons of basic and Bessemer pig iron, deliveries to extend over one year, on a sliding scale basis. The Westinghouse Air Brake Co., Wilmerding, Pa., has closed for approximately 15,000 tons of No. 2 foundry and gray forge, about equally divided, for prompt and last half delivery at a price said to be considerably under $15, valley, for the foundry iron. Inquiry for pig iron is heavier and several sales of small lots are noted, but prices are low and consumers do not appear to be in a hurry to close.

The most important development in the local coke market is the announcement that three of the largest producing interests are to be merged into one company, and that other companies will be taken over later. The market is quiet and prices are low. The scrap market continues weak.

Pig Iron.—Inquiry for various grades of pig iron during the week has been heavy, and, while one or two fairly large deals have been closed, buying is limited and prices are low. Announcement is made that the Westinghouse Air Brake Co. closed today for approximately 15,000 tons of No. 2 foundry and gray forge pig iron, about equally divided, for its Wilmerding, Pa., plant for prompt and last half delivery. While nothing definite has been made public with regard to the price paid, it is understood to be considerably under $15, valley, for the foundry iron. It is the general understanding that the company will close for additional tonnage shortly. A casting company at Sharon, Pa., has closed with a valley furnace interest for its basic and Bessemer pig iron requirements for the year, aggregating approximately 18,000 tons. The company originally entered the market for 10,000 tons of basic, and it was not generally known that Bessemer iron would figure in the deal. The iron will be furnished on a sliding scale basis, the price to be based on the average monthly pig iron quotations.

The pig iron market during the last week has been unsatisfactory and some of the inquiries for small tonnages have been withdrawn. Notwithstanding reports that Bessemer iron has been offered at less than $16, valley, no sales have been made at a lower figure. It is understood that a few small lots of off-grade basic iron have been sold slightly under $15, but furnace interests are not inclined to sell below this figure.

Several pig iron contracts will expire June 30, and in most cases users are inquiring in a quiet way as to what can be done in the way of prices with a view of covering for their future requirements. Several small lots of foundry iron for prompt delivery have been sold on a basis of $15, valley, and this figure is said to have been shaded in a few instances. The Westinghouse Machine Co. is in the market for 1,000 tons No. 2 foundry for its Attica, N. Y., plant. Several sales of carload lots of malleable and gray forge are noted, but prices are weak.

Pig Iron Prices.

(Prompt Shipment.)

Bessemer, valley	$16.00
Bessemer, Pittsburg	16.90
Basic, valley	15.00
Basic Pittsburg	15.90
No. 2 foundry, Pittsburg	15.65
Gray forge, Pittsburg	15.40
Malleable, Pittsburg	15.90

(Third Quarter.)

Bessemer, valley	16.00
Bessemer, Pittsburg	16.90
Basic, valley	15.00
Basic, Pittsburg	15.90
No. 2 foundry, Pittsburg	15.65
Gray forge, Pittsburg	15.40
Malleable, Pittsburg	15.90

Ferro-Alloys.—Demand for ferro-alloys is comparatively light and prices are irregular. Two or three local consumers have purchased ferro-manganese on a basis of $40, Baltimore. Some of the inquiries for 50 per cent ferro-silicon noted recently have been withdrawn, and few sales have been made:

We quote ferro-manganese at $40 to $40.50, Baltimore, for third quarter, and from $40.50 to $41 for second half. The freight rate from Baltimore to Pittsburg is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $59.50 to $60, Pittsburg; domestic 12 per cent, $26.90; 11 per cent, $25.90; 10 per cent, $24.90, Pittsburg, for third quarter, and $1 advance for last half. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—Comparatively little new business is developing at present and some makers are shading the 1.50c, Pittsburg, quotation on the small tonnages coming out. Specifications, however, continue heavy as a result of the several large pipe awards and contracts for boats and cars placed recently. The leading interest has its plate mills booked ahead for some time. About 4,000 tons of plates will be used in steel barges to be built by the American Bridge Co. for the National Tube Co. The freight rate controversy during the week has resulted in several orders for railroad equipment being held up and it is generally conceded that one eastern trunk line cancelled orders for about 3,000 cars. The Northern Pacific railroad is understood to have withdrawn its inquiry for 1,000 freight cars. The Baltimore & Ohio Railroad Co. has placed an order with the Standard Steel Car Co. for 1,000 40-ton capacity box cars, but has not taken any action with regard to its inquiry noted last week. The Caro-

lina, Clinchford & Ohio railroad is in the market for 250 box cars. While it is known that 1.45c, Pittsburg, is being done by some plants, other mills which have fairly heavy tonnage on their books are holding out for 1.50c, Pittsburg. Inquiries for freight cars which were expected to come out this week, are being held up temporarily. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.50c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Manufacturing interests are buying a fair volume of sheets, although jobbers still have large stocks on hand and are not buying very heavily. Specifications on blue annealed sheets continue satisfactory to makers. Some plants continue to shade prices on black and galvanized sheets, but price cutting is said to be confined to three or four plants. Many of the larger plants are pretty well sold up for delivery prior to Nov. 1. Present sheet prices, Pittsburg base, are as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, Nos. 3 to 8, 1.70c; Nos. 9 and 10, 1.75c; Nos. 11 and 12, 1.80c; Nos. 13 and 14, 1.85c; Nos. 15 and 16, 1.95c; box annealed sheets, Nos. 10 and 12, 2.05c; Nos. 13 and 14, 2.10c; Nos. 15 and 16, 2.15c; Nos. 17 to 21, 2.20c; Nos. 22 to 24, 2.25c; Nos. 25 and 26, 2.30c; No. 27, 2.35c; No. 28, 2.30c to 2.40c; No. 29, 2.45c; No. 30, 2.55c; galvanized sheets, Nos. 12 to 14, 2.50c to 2.55c; Nos. 15 and 16, 2.60c to 2.65c; Nos. 17 to 21, 2.75c; Nos. 22 to 24, 2.90c; Nos. 25 and 26, 3.10c; No. 27, 3.30c; No. 28, 3.40c to 3.50c; No. 29, 3.60c; No. 30, 3.85c; painted roofing sheets, $1.70 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $3 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—The Jones & Laughlin Steel Co., on Thursday of last week made its first shipment of black plate from its new tin plate plant at Aliquippa, Pa. Twelve mills are now in operation and the company has considerable tonnage on its books. For the first time in years, the leading interest last week operated its Shenango plant, 30 mills, to capacity and is now operating about 190 out of an entire serviceable capacity of 235 hot mills. The tin plate market continues active as regards both new business and specifications. Practically all of the tin can manufacturers have finished their buying for this year and the total tonnage from this source this year exceeds that of other prosperous years. The base price on tin plate, over which some premiums have been paid for desirable deliveries, is as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburg district.

Rails and Track Material.—The past week has been a fairly active one, new orders for standard and light rails and specifications against running contracts being slightly heavier than for the previous week. Owing to the fact that the output of some of the western rail mills has been sold well into the third quarter, some of the western railroads have been obliged to place their orders for prompt delivery rails with local mills. Although the eastern railroads have not taken up a great deal of extension work so far this year, they are going ahead with renewal and betterment work and are drawing heavily upon contracts placed some time ago. Lumber and mining interests are also placing a fair volume of tonnage of light rails. The leading interest during the week booked upwards of 3,000 tons of light rails in addition to several thousand tons of standards. Notwithstanding unfavorable reports from the East regarding alleged cancellation of orders by railroads, local makers of rails say that no orders have been cancelled in this district. There is only moderate buying of spikes and track bolts. We quote Bessemer rails as follows, the base price on open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails on base weight of 40 to 45 pounds, $28, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.75c to 1.80c, Pittsburg; hand spikes, 1.80c to 1.85c, Pittsburg; track bolts, 2.50c, Pittsburg.

Steel.—Users of Bessemer steel are showing a great deal of hesitancy in covering for their last half requirements. Inquiry is heavier, but owing to the present state of the market, users do not appear to be in a hurry to close and as a result, some mills, which are anxious to take on prompt delivery business, are alleged to be making low quotations. Notwithstanding that some buyers claim that they have been offered Bessemer billets as low as $25, makers' mill, it is not believed that any straight sales have been closed below $25.50 and we quote the market at from $25.50 to $26, makers' mill. Reports are also heard of low quotations on Bessemer sheet bars, but the general asking price is from $26.50 to $27 and in a few exceptional cases sales have been made at even higher prices. After making billets for nearly a year, the rolls at the Ohio works of the Carnegie Steel Co. have been changed and open-hearth tin bars are now being made. Open-hearth steel is as scarce as ever and there is no shading of prices:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $25.50 to $26.00, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets, from $28 to $28.50, Pittsburg. Forging billets are quotable at from $32 to $33, Pittsburg. Bessemer sheet and tin bars are quoted at $26.50 to $27, and open-hearth sheet bars are quoted at $29 to $29.50, at makers' mill, located within the $1, Pittsburg, freight limits.

Hoops and Bands.—Many of the contracts for hoops and bands will expire this month and local makers state they are experiencing no trouble in getting users to renew these contracts at present prices. There is a fair amount of new business developing, and specifications are coming in in a satisfactory manner. We quote the market as follows:

Hoops in carload lots, 1.55c to 1.60c; in less than carload lots, 1.70c to 1.75c; bands, 1.45c to 1.50c, base, with net extras, as per standard steel.

Merchant Bars.—Users of steel bars who have been holding back in covering for their requirements for the last half of the year with the expectation of getting lower prices are now coming into the market, and, on account of the sold-up conditions of some plants, are experiencing difficulty in placing their business even at 1.45c, Pittsburg, which is the absolute minimum in this market. Buying on the part of farming implement makers appears to have quieted down somewhat, although local makers continue to book a fair volume of business. Specifications against running contracts are entirely satisfactory to makers. There has been no new development in the bar iron situation. Actual bookings compare favorably with those

of the previous week and specifications are probably a little heavier. Demand for shafting continues heavy. We quote the market as follows:

Common iron bars, 1.55c to 1.60c, Pittsburg; Bessemer and open-hearth steel bars, 1.45c to 1.50c; plow and cultivator, 1.45c to 1.50c; channels, angles, zees, tees, under 3-inch, 1.45c to 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Structural Material.—Much of the proposed new structural work in this section is being held up indefinitely. Prices are not very firm, and the structural market is now one of the dullest branches of the local iron and steel trade. The American Bridge Co. has been awarded a contract for the new Ford City, Pa., plant of the Pittsburg Plate Glass Co., which will require more than 6,000 tons of structural material to replace the plant destroyed by fire some weeks ago. This company has also taken a contract for the General Electric Co.'s buildings at Erie, Pa., involving about 2,500 tons. James Stewart & Co., Pittsburg, will build a 38-stall roundhouse for the Pennsylvania railroad at Baltimore, Md. Two or three local projects involving from 1,000 to 5,000 tons of structural steel are pending. Some of the local plants have enough business booked to insure steady operation for two months, while others have but a few weeks' work on their books. Plants having the larger tonnage continue to ask 1.50c, Pittsburg, but this figure has been shaded in several instances:

Beams and channels, 15-inch and under, 1.45c to 1.50c, over 15 inches, 1.65c to 1.70c; zees, 1.55c to 1.60c; tees, 1.55c to 1.60c; angles, from 3 to 6 inches, 1.55c to 1.60c; over 6 inches, 1.55c to 1.70c; universal and sheared plates, 6¼ inches wide and wider, 1.55c to 1.60c.

Merchant Pipe.—The market on steel line pipe shows a vast improvement as compared with a month or so ago. Local mills are working on big orders that will insure steady operation for some time; inquiries are pending for other large lines, and there is increased buying in small lots on the part of most all consumers. Inquiries are noted this week for two new gas lines, which will involve about 400 miles of large pipe. In addition to this, the Kansas Portland Cement Co. is preparing to lay a 16-inch line from Independence, Kans., to its Oklahoma holdings, and the Kansas Natural Gas Co. is preparing to connect its wells in the same field with its Kansas trunk line system. A local gas interest is in the market for 50 miles of 16-inch steel pipe for Ohio delivery, and a western Pennsylvania interest has asked for bids on 37 miles of 10-inch steel pipe. There is no shading of prices on steel pipe. Buying of iron pipe is light and the market is weak. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches.

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	70	54	66	..
⅜ inch	71	57	67	53
½ inch	74	62	70	58
¾ to 6 inch	78	68	74	64
7 to 12 inch	72	57	68	53
13 to 15 inch	51½	..	..	..
PLUGGED AND REAMED.				
1 to 4 inch	76	66	71	61
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	63	51	58	46
½ to 4 inch	70	58	65	53
4½ to 8 inch	66	54	61	49
9, 10, 11 and 12 inch	59	47	54	42
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	59	48	54	43

Boiler Tubes.—Specifications against contracts for merchant and locomotive boiler tubes are heavy, and new bookings show a slight gain over the previous week. We quote the market as follows:

	Steel.	Iron.
1 to 1½ inch	49	43
1¾ to 2¼ inch.....	61	43
2½ inch	63	48
2¾ to 5 inch	69	55
6 to 13 inch	60	43

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destination east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

Wire Products.—Although sales are still confined to small lots, buying of wire and nails is more general, and the total tonnage involved in sales of the past week compares favorably with any other week this year. Owing to the fact that there has been an absence of heavy buying, prices are being maintained with difficulty. Reports that wire nails have been sold at $1.75 are not confirmed, although it is not likely that any business is being taken above $1.80. Most all sellers are quoting slightly lower prices on wire. We quote the market as follows, contracts for the jobbing trade being limited usually to 60 days:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to dealers, in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

Wire Rods.—There is not a great deal of new business in wire rods being booked, although users continue to specify quite freely. Owing to the light buying at this time, it is difficult to say what could be done in the way of prices. However, we continue to quote from $31 to $32, Pittsburg, on Bessemer and open-hearth rods.

Coke.—The local coke market has been exceptionally quiet during the last week. Following the announcement that three of the largest independent producing interests in the Connellsville region are to be merged and that other companies will be taken in later, a few sellers have advanced their quotations slightly on both prompt and last half coke, but there has been practically no buying. Prices at present are about the same as last week. It is expected that a statement will be issued some time this week giving details of the proposed merger. In some quarters, it is believed that the announcement of the merger will have a good effect upon market conditions. Investigation shows that stocks at the furnaces are comparatively low, but even the low quotations made by some dealers are not attractive enough to induce furnace interests to enter the market for prompt shipment coke. Several fairly large contracts for both furnace and foundry coke will expire this month, but consuming interests do not appear to be in a hurry to cover for future requirements. The inquiry for 25,000 tons of coke a month for last half sent out several days ago by furnace interests has been withdrawn. We quote standard Connellsville coke for prompt delivery at from $1.60 to $1.70, ovens, and on contract we quote from $1.75 to $1.90, ovens. On high grade Connellsville foundry coke, we quote from $2.15 to $2.35, ovens, for prompt delivery. On contract we quote from $2.25 to $2.50, ovens. The Connellsville *Courier's* figures for the week ending May 28 show 30,422 ovens active with an output of 396,443 tons, compared with 30,420 active ovens and a production of 393,185 tons the previous week.

Old Material.—The Pennsylvania Railroad Co. during the week asked for bids of approximately 20,000 tons of old material, including about 10,000 tons of re-rolling rails. Bids on this list will close Thursday. The scrap market last week showed a noticeable improvement in sentiment, but there

is little activity at present and prices are somewhat irregular. Notwithstanding that stocks at furnaces are low, consumers are not anxious to close even at low quotations made by some dealers. A local steel company has bought a fair tonnage of cast borings and three sales of carload lots of heavy melting steel and No. 1 wrought scrap are noted. The latter can be had at from $15.75 to $16.25. A reduction of 50 cents is noted in the price of cast borings, the quotation now being $8 to $8.50. We quote, gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$15.00 to 15.50
Rerolling rails	16.50 to 17.00
Bundled sheet scrap	11.50 to 12.00
Iron axles	25.00 to 25.50
Old iron rails	17.00 to 17.50
No. 1 wrought scrap	15.75 to 16.25
Old car wheels	15.00 to 15.50
Low phosphorus	18.00 to 18.50
Machine shop turnings	10.00 to 10.50
Cast borings	8.00 to 8.50
No. 1 cast scrap	14.75 to 15.25
Malleable	15.00 to 15.50
Stove plate	10.25 to 10.75

CHICAGO.

Pig Iron Not Active—Heisen Building Contract Awarded.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, June 7.

Pig Iron.—Taken as a whole, the pig iron market in Chicago has been inactive and without special interest during the past week. The principal feature has been the reported sale, by the leading southern interest, of a large block of iron, some of which is supposed to have come into this territory. The reputed purchasers are steel foundry and tack interests. The leading steel foundry interest has, within the last few days, provided for its basic requirements for the remainder of the year, the plants being located at Fort Wayne, East St. Louis and Granite City. This would mean quite a large tonnage of basic iron. Outside of the purchases mentioned, the buying has been of rather small character, which has been done very quietly, foundry and malleable grades figuring to some extent in these transactions. One lot of 2,000 tons of foundry iron was required by a local interest and northern and southern furnaces competed for the business, which it is understood went to the latter on account of price differential. Prices are at about the same level as last week, although the $11.50, Birmingham, figure has come to be looked upon as the lower quotation in the current spread. It is reported that some of the basic iron mentioned above was bought at this price, or even better.

Lake Superior charcoal	$18.50 to 19.00
Northern foundry No. 2	16.50 to 17.00
Southern foundry No. 2	15.85 to 16.35
Southern silveries, 5 per cent silicon	17.85 to 18.35
Jackson Co. silveries, 8 per cent.	20.40 to 20.90
Malleable Bessemer	16.50 to 17.00
Alabama basic	16.85 to 17.35

Billets.—There are no billets being sold in this market by local makers, excepting those covered by contracts. The price is entirely governed by the price in the Pittsburg market and the freight from that point.

Merchant Bars.—The demand for steel bars keeps up at a very satisfactory rate and this one line continues to be most active in point of new business and in specifying on contracts already made. In almost every other department, there is a tendency to make concessions in prices whenever there is any contest for business. But in the case of soft steel bars, prices are very well maintained. The orders for steel for the several thousand cars recorded have not appeared in the market, but when this business comes out, it will be an additional element of strength in the bar market. Iron bars are not so well supported and prices are hardly as firm as they have been.

We quote, for Chicago delivery, as follows:

Bar iron, 1.45c to 1.50c; hard steel bars, re-rolled, 1.50c to 1.60c; soft steel bars and bands and small shapes, 1.63c to 1.68c, base; hoops, 1.78c to 1.88c; planished or smooth finished tire steel, 1.83c to 1.88c; iron finish, up to 1½ by ½ inch, 1.78c, base, tire card; iron finish, 1½ by ½ inch and larger, 1.63c, base; bar card; channels for solid rubber tires, ¾ to 1 inch, 2.13c, flat, and 1⅛ inch and larger, 2.03c, flat; smooth finished machinery steel, 1 inch and larger, 2.43c; flat sleigh shoe, 1.73c; toe calk steel, 2.23c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 55 per cent off the list for carload lots, and 50 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.90c to 2c, base; soft steel bars, 1.90c to 2c per 100 pounds, base; soft steel hoops, 2.40c to 2.50c; full extras.

Structural Material.—After the activity in this department last week, the showing for the present week looks very small, the number of structural contracts closed being few, and the total tonnage not at all heavy. There is a great deal of figuring being done, however, and after the disturbance in regard to freight rate injunctions has subsided there probably will be a large amount of structural tonnage placed. Competition is rather keen, as has been noted in these reports heretofore, and on desirable business the figures quoted below are shaded $1 a ton. The American Bridge Co. took the contract for the Orpheum theater at Seattle for 500 tons, and also a bridge in the state of Washington for the Chicago, Milwaukee & St. Paul railway, 250 tons. The Minneapolis Steel & Machinery Co. secured the contract for a smelter for the Chino Copper Co., to be erected near Salt Lake, Utah, requiring 1,500 tons. The Mosher Mfg. Co., Dallas, Tex., booked a contract for a bone house for Swift & Co., at Fort Worth, 480 tons.

We quote, mill prices, for structural shapes, Chicago delivery, as follows:

Beams and channels, 15 inches and under, 1.63c to 1.68c. For extras see Pittsburg report.

Local store prices are as follows: All angles, 3 inches and larger, including 6 inches, $1.90 to $2 per 100 pounds; angles over 6 inches, $2 to $2.10 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.90 per 100 pounds, base; channels, 3 inches and larger, $1.90 per 100 pounds, base.

The contract for the fabrication and erection of the 22-story Heisen building, for which plans were drawn by Purdy & Henderson, finally was let today to the Modern Steel Structural Co., of Waukesha, Wis. The Lackawanna Steel Co. will furnish the steel, which amounts to nearly 5,000 tons.

Plates.—There is nothing of special interest to report in this line, there being only the usual routine business going on. Prices are not firmly held and from the figures quoted below a concession of $1 a ton could easily be obtained on desirable business.

We quote, Chicago delivery, as follows: Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.63c to 1.68c. For extras, see Pittsburg report.

Store quotations are without change, as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.90c to 2c; from 72 inches to 96 inches wide, 2c to 2.10c; 3-16 inch up to and including 60 inches wide, 2c to 2.10c; 72 inches, 2.25c to 2.35c; No. 8, up to 60 inches wide, 2.05c to 2.15c. Flange and head quality, 25c extra.

Steel Rails and Track Supplies.—The business in track fastenings has been of good proportions, but nothing has been done in standard steel rails during the past week. Some little

business has been taken for light section rails. Quotations on spikes are less steady than they have been, with a tendency to make slight concessions.

See Pittsburg report for prices on standard sections.

On light rails, Chicago delivery, we quote as follows: Light rails, 40 and 45-pound, $27; 30 and 35-pound, $27.75; 16, 20 and 25-pound, $28; 12-pound, $29.

Light section re-layers, 45 pounds and under, subject to inspection, $21 to $23; standard section re-laying rails, subject to inspection, $23.50 to $24.

Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.75c to 1.85c; smaller size spikes, 1.80c to 1.90c, base; track bolts with square nuts, 2.50c to 2.60c, base; with hexagon nuts, 2.65c to 2.75c.

Sheets. — Heavy production is responsible for a weak condition in black sheets, and also painted and galvanized. Concessions of from $2 to $3 on galvanized and painted, and from $1 to $2 on black sheets, is the rule, rather than the exception. Blue-annealed sheets are not subject to any concession, there being a good demand for them.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents.

We quote store prices at Chicago as follows: No. 10, 2.25c to 2.35c; No. 12, 2.30c to 2.40c; No. 14, 2.35c to 2.45c; No. 16, 2.45c to 2.55c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3c to 3.10c; No. 30, 3.30c; galvanized sheets, Nos. 10 to 16, 3.20c to 3.30c; Nos. 18 and 20, 3.35c to 3.45c; Nos. 22 to 24, 3.50c to 3.60c; No. 26, 3.50c to 3.80c; No. 27, 3.90c to 4c; No. 28, 4.10c to 4.20c; No. 30, 4.50 to 4.60c.

Wire Products.—There is a good, seasonable demand for wire goods, but there is also rather keen rivalry for business, and possibly some quiet shading in exceptional cases. The tonnage represented in orders averages up well and compares most favorably with other seasons.

We quote, Chicago delivery, as follows:

Wire nails, jobbers' carload lots, $2.03; retailers, carload lots, $2.08; retailers' less than carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; with 30c for galvanizing; plain wire to jobbers, $1.83; plain wire, retailers' carload lots, $1.88; staples, bright, $2.03.

Merchant Pipe and Tubes.—Mill business is good in this territory, and discounts are unchanged. Out of store business is quite active, and prices show no indication of weakening.

For mill discounts, see Pittsburg report.

We quote, out of store, as follows: Wrought steel pipe, black, ⅛ inch to ¼ inch, 67.2 per cent; ⅜ inch, 68.2 per cent; ½ inch, 71.2 per cent; ¼ inch to 6 inches, 75.2 per cent; 7 inches to 12 inches, 68.2 per cent. Iron pipe, about 5 points higher.

Lap weld steel tubes, 2¾ inches to 5 inches, 60 to 62 per cent; charcoal iron tubes, 2¼ inches to 4 inches, 48 to 50.

Cast Iron Pipe.—There is a fair amount of trade going on in this line, but no large municipal contracts have been noted. At Essexville, Mich., during the past week, 500 tons was sold by the United States Cast Iron Pipe & Foundry Co.

We quote, prices f. o. b. Chicago, as follows: 4-inch water pipe, $28.50; 6 to 16 inches, $27.50; larger sizes, $26.50; gas pipe, $1 a ton higher.

Old Material.—Most of the list shows no change and but very little interest is taken in the market. The Rock Island secured some very fair prices for the scrap included in its list, which came out last week. There is very little tendency to buy at the present time, and but little material pressing on the market. We quote:

Old car wheels	$15.00 to 15.50
Old iron rails	17.00 to 17.50
Rerolling rails (4 ft. and over)	17.00 to 17.50
Old steel rails (2 ft. and under)	14.75 to 15.25
Frogs, switches and guards	13.00 to 13.50
Heavy melting steel	13.00 to 13.50
Shoveling steel	12.50 to 13.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.75 to 13.25
No. 2 R. R. wrought	11.75 to 12.25
Arch bars and transoms	15.50 to 16.00
Knuckles, couplers and springs	12.50 to 13.00
Shafting	17.50 to 18.00
Iron car axles	20.00 to 20.50
Steel car axles	20.00 to 20.50
Locomotive tires	18.00 to 18.50
Dealers' forge	11.50 to 12.00
Pipes and flues	9.50 to 10.00
No. 1 cast, 150 lbs. and less	13.00 to 13.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.25 to 8.75
No. 1 boiler cut	10.00 to 10.50
Boiler punchings	15.00 to 15.50
Cast and mixed borings	5.00 to 5.50
Machine shop turnings	8.00 to 8.50
Railroad malleable	12.50 to 13.00
Agricultural malleable	11.50 to 12.00
Stove plate and light cast scrap	11.25 to 11.75
Angle bars, splices, etc. (iron)	15.00 to 15.50
Angle bars, steel	13.00 to 13.50

CLEVELAND.

One Round Lot of Iron Sold—Heavy Movement of Ore.

Office of THE IRON TRADE REVIEW, Penton Bldg., Chestnut and E. 12th, June 7.

Iron Ore.—The May movement of ore, 6,081,358 tons, making the total movement to June 1, 7,601,665 tons, shows what the fleet is capable of doing under adverse circumstances, and at a time when there is not an urgent need for new supplies for the furnaces. The movement to June is 4,292,597 tons ahead of last year, but it is too early to predict whether this rate of increase will be continued.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Messabi Bessemer, $4.75; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

Pig Iron.—The large number of inquiries pending last week did not, as a rule, develop into orders, the one large sale reported being 5,000 tons to a Cleveland foundry, part malleable and part foundry grades, for delivery during the last half, at about $15, valley. The inquiry from the Babcock & Wilcox Co. for 5,000 tons for delivery at Barberton during the last half brought out some very low quotations, $15, valley, being shaded, but the company has not yet placed an order, and probably will not do so. Its attitude has not been helpful to the market.

In spite of the generally quiet tone which has prevailed, a considerable tonnage of iron has been sold during the past month through Cleveland agencies. One agency has made sales since May 15 amounting to 90,000 tons. For prompt delivery we quote, delivered in Cleveland, as follows:

No. 1 foundry	$16.00 to 16.25
No. 2 foundry	15.50 to 15.75
No. 2 Southern	16.10 to 16.35
Gray forge	15.25 to 15.50
Bessemer	16.90
Lake Superior charcoal	18.50 to 19.00
Jackson Co. 8 per cent silvery	20.00 to 20.50

Coke.—The Cleveland interest which was inquiring for furnace coke last week has not yet contracted. The furnace coke market is very dull. There is only a fair business in foundry coke, but a few sales have been made as high as $2.50 for last half delivery. We quote Connellsville furnace coke at $1.55 to $1.70, for prompt delivery, and for second half, $1.80 to $1.90. Connellsville foundry coke, for prompt delivery, we quote at $2.15 to $2.35, and for second half, $2.25 to $2.50.

Finished Material—The leading interest reports that its May business, both as to new orders and specifications, was considerably in advance of April, and that business this month was in good shape until the railroad freight agitation gave a jolt to the market. A few days ago, the outlook was dark, but conditions are now improving. During the past few days, both the leading interest and independents have made additional contracts with agricultural implement concerns, nearly all of which have now

covered for their requirements, at least up to Jan. 1. Good business in shafting and forging material has been done. The King Bridge Co. has been awarded the contract for 1,900 tons of bridge material for several bridges for the Nickel Plate. Of this tonnage, about 600 or 700 tons is of Bethlehem sections, and the remaining steel will probably be furnished by the Lackawanna Steel Co. No contracts of importance for new buildings have been placed. Prices of bolts and rivets are being shaded.

Old Material.—The market for scrap here continues dull and the gradual decline in prices is not checked. Reductions of 50 cents a ton are noted in old iron rails, car wheels, boiler plate, steel axles, agricultural malleable, axle turnings, grate bars and stove plate. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (under 6 feet)	15.00 to 15.50
Old car wheels	14.00 to 14.50
Old steel boiler plate	12.00 to 12.50
Malleable iron (railroad)	14.00 to 14.50
Steel axles	19.50 to 20.00
Malleable iron (agricultural)	12.00 to 12.50
Heavy steel	13.75 to 14.00
Country mixed steel	12.00 to 12.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.00 to 14.50
No. 1 busheling	12.00 to 12.50
No. 1 machine cast	12.25 to 12.50
Axle turnings	10.00 to 10.50
Machine shop turnings	7.25 to 7.75
Grate bars	10.50 to 11.00
Pipes and flues	11.00 to 11.50
Tank iron	9.00 to 9.50
Sheet iron	6.00 to 6.50
Wrought drilling	7.25 to 7.75
Stove plate	11.00 to 11.50
Cast borings	6.50 to 6.75

CINCINNATI.

Few Pig Iron Sales Noted and Market Not Yet Firm.

Office of THE IRON TRADE REVIEW,
Room 11, Blymyer Bldg., June 7.

Pig Iron.—Sales in this immediate territory during the week have been quite light, as compared with points east and west, where inquiry has developed to some extent. The general impression obtains that a large proportion of consumers figure that there is no immediate reason why they should buy hurriedly, and therefore take little interest in the situation beyond keeping a sharp lookout for any bargains that may present themselves, and buying for immediate necessities. Reports indicate that the southern interests that have been making an $11.50 quotation have disposed of sufficient tonnage to put them in good condition, and are now on a $12 basis. Under present conditions, however, it is doubtful whether this latter figure would be maintained, should bona fide inquiry develop some desirable business. So far as the situation in the south is concerned, prices appear to be on a $12 basis until a desirable purchaser appears. Such appearance often materially changes the entire situation and has a tendency to establish lower quotations. Quotations for northern iron are practically unchanged, and appear to be fairly strong on $15, Ironton, basis, yet there is no doubt that sales have been made at lower figures. Shipments are said to be all that can be desired, and few cancellations are noted. Several of the large eastern pipe companies are said to be watching the situation very carefully, and are buying considerable iron at attractive concessions. Silicon irons are rather quiet and prices slightly weak. The lower grades are in fair demand and show no variance from schedule. A southern Ohio melter is asking prices on a fair tonnage of foundry grades. An Indiana concern wants 400 tons of southern foundry. A northern Ohio melter is inquiring for 2,000 tons of northern foundry grades for last half delivery. A concern in northern Ohio has made an offer on 500 tons of malleable but same has not yet been accepted. A southern Ohio manufacturer bought 100 tons of high silicon at approximately schedule. A Michigan melter bought 175 tons for last half delivery, on a $15.45, Ironton, basis, 1,000 tons of northern foundry went into eastern territory at market quotations. We quote prices based on freight rate of $3.25 from Birmingham and $1.20 from Ironton, as follows:

Southern foundry No. 1	$15.50 to 15.75
Southern foundry No. 2	15.00 to 15.25
Southern foundry No. 3	14.50 to 14.75
Southern foundry No. 4	14.50 to 14.75
Southern No. 1 soft	15.50 to 15.75
Southern No. 2 soft	15.00 to 15.25
Southern gray forge	14.50 to 14.75
Northern No. 1 foundry	16.45 to 16.70
Northern No. 2 foundry	15.95 to 16.20
Northern No. 3 foundry	15.45 to 15.70
Jackson county 6 per cent silicon	18.70
Jackson county 8 per cent silicon	19.70
Jackson county 10 per cent silicon	20.70

Coke.—As July 1 approaches, which is usually the month when considerable foundry coke is contracted for, some slight increase in inquiry is noted. Several large contracts for furnace grades have been closed. Some Ohio furnaces and also several in the south are making inquiries for the year's requirements, which will aggregate a large tonnage. We quote from the leading coke producing districts, as follows:

	Prompt shipment.	Last half of year 1910.
Connellsville district:		
Foundry coke	$2.25 to 2.50	$2.40 to 2.75
Furnace coke	1.60 to 1.75	1.80 to 2.10
Wise county district:		
Foundry coke	2.25 to 2.40	2.25 to 2.50
Furnace coke	1.75 to 1.90	*Sliding scale basis.
Pocahontas district:		
Foundry coke	2.25 to 2.50	2.25 to 2.50
Furnace coke	1.75 to 1.90	1.90 to 2.10
New River:		
Foundry coke	2.40 to 3.00	2.50 to 3.25
Furnace coke	2.25 to 2.40	2.25 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Structural shapes and plates are quotable at 1.50c to 1.55c, and bars, 1.45c to 1.50c, Pittsburg. New structural is quiet but is better than it was several months since. Deliveries show considerable improvement, and contract time is being made on shipments. The demand locally is light, and nothing of any importance is pending.

Old Material.—Actual transactions during the week have been light, and the demand for scrap is exceedingly dull and market conditions absolutely featureless. Dealers apparently are not moving their stocks with any regularity, and the result is yards show some accumulation. Prices are weak, and according to dealers are about as follows:

No. 1 R. R. wrought, net tons.	$12.00 to 12.50
No. 1 machinery, net tons	11.50 to 12.00
No. 1 busheling, net tons	11.00 to 11.50
Old iron rails, gross tons	17.50 to 18.00
Old iron rails, rerolling	17.00 to 17.50
Old short lengths, gross tons	14.50 to 15.50
Old iron axles, net	18.00 to 19.00
Heavy melting scrap, gross tons.	12.00 to 12.50
Stove plate, net tons	9.50 to 10.00
Heavy turnings, net tons	8.50 to 9.00
Cast borings, net tons	6.00 to 6.50
Car wheels	15.00 to 15.50
Grate bars	9.50 to 10.00

The Domhoff & Joyce Co. has been appointed agent for the Standard Iron Co., in Chicago and St. Louis territory, effective July 1.

PHILADELPHIA.

Fair Buying of Pig Iron—Another Change in Scrap Syndicate.

June 6.

Pig Iron.—Considerable buying of pig iron, mainly foundry grades, continues in this territory, but maximum prices are ruling and the situation shows no improvement upon this score. Those makers who are willing to meet the present price ideas of consumers are booking a very fair tonnage as the latter are disposed to close upon forward requirements around the ruling levels. A good part of the going business, however, is being done on offers and by negotiations carried on beneath the surface, although the fresh open inquiry is holding up quite well. Standard No. 2X from eastern Pennsylvania is selling around $17, delivered, but $16.75 or $16, furnace, has been done. Cases are to be noted, however, where No.

2 plain iron has been sold upon this latter basis. Some Virginia iron is selling at $14, furnace, for No. 2, or $16.80 to $17, delivered. The market is productive of a number of small sales of foundry grades. Two of the cast iron pipe companies made additional purchases in the week of both northern and southern lower grades, aggregating several thousand tons. They are obtaining odd lots of southern iron for quick shipment at $10.75 to $11, Birmingham, for gray forge and No. 4, equivalent to $15, delivered, or slightly less where water transportation is employed. There seems to be more interest on the part of these buyers in northern irons due, no doubt, to the limited supply of low grades in the south, and offers have been made around $15.25, delivered, but refused by northern makers. In one instance, it is reported that better than $15.50 was paid for a lot of northern pipe iron. A steel company is in the market for 1,000 tons of standard forge, although it is known to have considerable iron of this class upon its banks.

In steel making grades, one eastern consumer has closed for about 5,000 tons of standard low phosphorus to be delivered in equal monthly installments—one the last half, at $20.50 at the furnace, or on a basis of $23, Philadelphia, although the iron will not come to this immediate district. Under the low prices ruling on heavy melting steel, leading eastern basic consumers have materially increased the percentage of scrap in their mixtures and reduced their pig iron accordingly. At the present rate of consumption, the iron under contract will last them to extended forward dates and, as a consequence, they are listless in their attitude toward the present market. Small lots of basic for prompt shipment have sold at $16.25, delivered, but $16 could evidently be done on any sizable tonnage.

For prompt and third quarter delivery in Philadelphia teritory, we quote, as follows:

No. 1X foundry	$17.50 to 17.75
No. 2X foundry	16.75 to 17.00
No. 2 plain	16.25 to 16.50
Gray forge	15.50 to 16.00
Basic	16.00 to 16.25
Low phosphorus	22.75 to 23.25
No. 2 Birmingham	16.00 to 16.25
No. 2 Virginia	16.80 to 17.00

Coke.—Some eastern furnaces which have not yet covered for their last half needs of coke are offering $1.75, ovens, but sellers of the best Connellsville grades are holding for higher prices. One interest bought about 10,000 tons in the week to fill out its next several months' needs. There has been considerable buying of foundry coke for the last half at a market range of $2.25 to $2.50 for strictly standard grades.

Finished Material.—An unsettling of sentiment over the possible curtailment of railroad buying because of the government's action upon the freight rate question, is apparent in finished lines. There has been no effect, however, upon the actual volume of current business, which continues fully up to the mark of the recent past and in some products shows mild improvement. Eastern plate makers are getting steady specifications from a variety of sources and the incoming tonnage is well sustained. Considerable material is being ordered from these interests for bridge work. In structural lines a number of contracts are pending, some of which have been held up for several weeks. Small work is quite plentiful. Prices on fabricated material show no greater strength and range from about $46 to $48, Philadelphia, on regular commercial work. Bids went in again this week upon a building at Hazleton, Pa., which has been refigured. About 300 tons are called for for an exposition building at Richmond, Va. The strength of steel bars and the weakness in bar iron still prevail. Some sales of small Bessemer billets have been made in this market at rather low prices.

Interest is being shown in the approaching competition for the large steel tonnage involved in the mitre gate construction on the Panama canal upon which bids close June 15. Some eastern steel companies have decided not to attempt to secure the business owing to the extended deliveries, ranging from one and one-half to two years, and the close quotations that are expected to be made. Other eastern and Pittsburg fabricating and steel interests are now preparing their estimates. As previously stated, the work will require about 58,000 tons of steel, of which 40,000 to 42,000 tons will be plates and from 16,000 to 18,000 tons structural shapes.

We quote, for delivery in Philadelphia and vicinity, as follows: Structural shapes, 1.65c to 1.70c; plates, 1.65c to 1.70c; steel bars, 1.60c to 1.65c; iron bars, 1.45c to 1.50c; 4 x 4 inch, open-hearth rolling billets, $28 to $29, eastern mill.

Old Material.—An interesting development in the old material situation in this district is the announcement that one of the associated mills will henceforth buy its cast, car wheel and stove plate requirements in the open market. Some lots of stove plate have already been sold under this plan. It will continue to take its heavy melting stock and other steel material through the central agency. This buyer is other than the mill which withdrew from the association sometime ago, but subsequently returned to this method of securing its supplies. There is no definite improvement in the market although there has been a little freer buying of late of grades other than steel. The associated mills are offering from $14 to $14.50 delivered according to location, but are getting only odd lots at the former price, and appear to be in need of little tonnage. There is considerable reluctance to sell by scrap holders by reason of dissatisfaction with prices. Some offers of $17 delivered have been made for railroad wrought, but yard wrought can be bought down to $16 delivered. We quote gross tons delivered in eastern Pennsylvania consuming territory as follows:

Old steel rails (rerolling)	$16.75 to 17.25
Heavy melting steel	14.50 to 15.00
Old car wheels	15.00 to 15.50
Old iron car axles	25.00 to 26.00
Old steel car axles	20.00 to 21.00
No. 1 railroad wrought	16.50 to 17.00
Wrought pipe	15.00 to 15.50
Cast borings	8.25 to 8.75
Wrought turnings	9.50 to 10.00
Heavy cast scrap	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Stove plate	10.00 to 10.50

ST. LOUIS.

Fair Basic Sales Made and More Inquiries Are Noted.

June 6.

Pig Iron.—Sales of basic iron totaling 25,000 tons have been made within the last few days for shipment into the St. Louis territory. Of this, 5,000 tons were closed with a large steel manufacturing plant in St. Louis by local sales agents, for shipment over the last half of the year. This inquiry has been tentatively on the market for more than a month. Another sale of 20,000 tons of basic was made to a large steel foundry in Granite City, Ill., for last half shipment. Of this lot, 7,500 tons was closed by local agents, the remainder going to out-of-town agents. The prices at which the iron was sold were not made public.

Inquiries totaling about 3,000 tons, mostly for small lots, are in the market. Some of these are for second half and some for last quarter shipment. Whether all of them are bona-fide, or mere feelers, is somewhat problematical. Most of the local agents insist that $12 is the minimum price for Southern No. 2, although one occasionally hears of an $11.75 price, and a few agents contend that even

this could be shaded. The injunction restraining the railroads from raising their schedules, undoubtedly has indirectly had the effect of depressing pig iron quotations in the St. Louis territory, but local agents insist that it will only be temporary. Our prices, delivered, to which the freight of $3.75 from Birmingham has been added, follow:

Southern No. 1	$16.25
Southern No. 2	15.75
Southern No. 3	15.25
Southern No. 4	14.75

Coke.—Contracts were closed within the last few days for upwards of 75 cars of coke for shipment up to July 1, 1911, but there are no inquiries on the market of consequence. Coke prices are firm, as follows: Connellsville 72-hour foundry, $2.25 to $2.50, ovens; Connellsville 48-hour furnace, $2 to $2.25; Virginia 72-hour foundry, $2.25 to $2.50; Virginia 48-hour, $2 to $2.25. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields, when shipment is destined beyond St. Louis.

Finished Material.—We quote the following base prices out of stock, St. Louis. Tank plates, ¼ inch and heavier, up to 72 inches wide, $1.95 to $2.05; from 72 inches to 96 inches, $2.05 to $2.15; sheets, No. 10, blue annealed, $2.30 to $2.40; bar iron, $1.85 to $1.95; soft steel bars, $1.95 to $2.05, base.

Old Material.—Business in scrap iron is practically at a standstill, with prices remaining as follows:

Old car wheels	$17.00 to 17.50
Old iron rails	17.50 to 18.00
Rerolling rails (4 ft. and over)	16.00 to 16.50
Old steel rails (2 ft. and under)	14.00 to 14.50
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	13.00 to 13.50
Heavy melting steel	13.00 to 13.50
Shoveling steel	12.50 to 13.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.75 to 13.25
No. 2 R. R. wrought	11.50 to 12.00
Arch bars and transoms	16.00 to 16.50
Knuckles, couplers and springs	12.00 to 12.50
Shafting	15.75 to 16.25
Iron car axles	20.00 to 21.00
Steel car axles	20.00 to 21.00
Locomotive tires	17.00 to 17.50
No. 1 country wrought	11.00 to 11.50
Pipes and flues	9.75 to 10.25
No. 1 cast 150 lbs. and less	13.00 to 13.50
No. 1 busheling	11.00 to 11.50
No. 2 busheling	8.00 to 8.50
No. 1 boiler cut	9.75 to 10.25
Boiler punchings	10.25 to 10.75
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	9.00 to 9.50
Railroad malleable	12.00 to 13.00
Agricultural malleable	10.00 to 10.50
Stove plate and light cast scrap	10.00 to 11.00
Angle splice bars, iron	15.00 to 15.50
Angle splice bars, steel	14.00 to 14.50

Machinists employed in the larger number of shops in Boston went out on strike June 1, laying down their tools at 2 o'clock. Their demands include a minimum wage and a horizontal wage advance. Molders and coremakers have also made demands.

BUFFALO.

Pig Iron Market Dull — Numerous Building Projects.

Office of THE IRON TRADE REVIEW, 932 Ellicott Square, June 7.

Pig Iron.—The market has been very dull for the past week and little business is reported. Some tonnage has been placed, but not as much as in the week before. Representatives of some of the furnaces say that they have not been actively seeking business since prices fell so low. In some quarters, however, an improved tone is noted, and inquiries are coming in very well. The prices are a little lower than a week ago. We quote f. o. b. furnace, as follows:

No. 1X foundry	$16.00 to 16.50
No. 2X foundry	15.50 to 16.00
No. 2 plain	15.25 to 15.75
No. 3 foundry	15.00 to 15.50
Gray forge	15.00 to 15.50
Malleable	15.75 to 16.25
Basic	15.75 to 16.25
Charcoal	19.00 to 19.50

Finished Product.—The past week has seen no reduction in the volume of business and specifications are coming in just as they have for some time past. In the structural lines a few lettings calling for fair tonnage have been made, and a number of fairly large jobs are in the architects' hands. The contract for new car shops which the New York Central is building at Oswego has been let to the Lackawanna Bridge Co. Figures will be received this week for a warehouse the Western Transit Co. is about to build calling for about 200 tons. Bids will close June 9 for the iron and steel work on the open market building to be erected by the city at the Clinton market, which will require about 300 tons. The specifications call for about 300 tons. A fireproof vaudeville theater to be erected on Fillmore avenue by the Fillmore Amusement Co., is in the hands of the architect, W. Zawadski. It will have a seating capacity of 1,600. Another theater job at Syracuse is almost ready for figures. Among the prospects is a fireproof hotel to be built at Jamestown, replacing the Sherman House, destroyed by fire. The site is owned by Charles Samuels, Jamestown, who will put up the building, but no steps have yet been taken. The needed $100,000 for additions to Canisius College, Buffalo, has been raised and plans will soon be prepared.

Old Material.—No change is noted in the condition of the scrap market, and no business of any account is being done. The prices here given are nominal. We quote, gross tons, f. o. b. Buffalo, as follows:

Heavy melting steel	$13.00 to 13.25
No. 1 railroad wrought scrap	14.00 to 14.50
No. 1 railroad and machine cast scrap	12.75 to 13.25
Old steel axles	17.00 to 18.00
Iron axles	22.50 to 23.00
Car wheels	14.00 to 15.00
Railroad malleable scrap	13.00 to 13.50
Machine shop turnings	7.00 to 7.50
Cast iron borings	5.00 to 5.50
Low phosphorus steel scrap	18.00 to 18.50
Old iron rails	16.00 to 16.50
Tank iron	11.00 to 11.50
Sheet iron	7.50 to 8.00
Stove plate	11.50 to 12.00
Pipes and flues	11.00 to 11.50
Grate bars	10.50 to 11.00
Boiler plate	11.75 to 12.25

NEW YORK.

Pig Iron Buying at Concessions—Structural Outlook Better.

Office of THE IRON TRADE REVIEW, 1115 West Street Bldg., June 7.

Iron Ore.—Additional sales of about 20,000 tons of special analysis foreign ores have been made to eastern furnaces. A new Montreal interest with mines at Torbrook, Nova Scotia, has sold about 15,000 tons of high phosphorous silicious ore at a reported price of about seven cents a unit, Philadelphia. The phosphorus in this iron runs 1½ per cent and the iron content from 48 to 50 per cent. This high phosphorus stock is intended to take the place of mill cinder in the furnace practice of the buyers. One cargo of Spanish low phosphorus ore, about 5,000 tons, has also been distributed to several interests. The condition of high ocean freights on trans-Atlantic ore to the eastern seaboard, continues. The steamer Border Knight has just been chartered for a cargo of 5,500 tons from Algeria to Philadelphia or Baltimore at 11s. The freight market rules from 10s 6d to 11s.

Pig Iron.—The increased volume of buying of foundry pig iron at New Jersey, Hudson River and New England points is being well maintained, but sales continue to be made at price concessions. The new inquiry is good, but scarcely as brisk as it has been. In New Jersey territory, where the most interest of consumers is still to be noted, the range of prices on regular analysis, No. 2X iron, is from $16.50 to $16.75, delivered, and quotations approximating the lower level appear to be more freely made. This is equivalent to about $15.75 to $16, eastern Pennsylvania furnace. Some up-state furnaces have been aggressive for New Jersey as well as New England tonnage, and are quoting about $16.75, New Jersey points, or $15, at the furnace, for No. 2X. Other than the strict analysis grades from eastern Pennsylvania have sold below the minimum quoted on the regular brands. Sales of the week have included 3,000 to 5,000 tons of foundry

irons for a boiler manufacturer for an eastern plant, and 2,000 to 3,000 tons to other New Jersey specialty and machinery shops. In addition, a sale of 1,000 tons of southern iron for forward shipment to an up-state melter at $12, Birmingham, is noted. An eastern implement maker, who was prematurely reported to have bought, closed for about 5,000 tons in the week. One lot of 500 tons of forge at about $15.50, delivered, is noted. In New England, Connecticut foundries have taken several thousand tons additional and there has been continued buying by other interests in that territory. The inquiry for about 6,000 tons for a Massachusetts melter is still pending. New England prices range from $17.25 to $17.50, for No. 2X, with the bulk of the business going to New York furnaces at $15.25 to $15.50, at the furnace, a level which most Buffalo makers will not meet. Some Virginia iron continues to be sold in New Jersey and New England territory at $14, furnace, for No. 2. The inquiry for about 5,000 tons of low phosphorus for an eastern consumer has been closed. Cast iron pipe companies are buying at regular intervals. We quote, delivered at New York tidewater for prompt and third quarter shipment, as follows:

Northern foundry No. 1	$17.00 to 17.50
No. 2X foundry	16.50 to 17.00
No. 2 plain	16.00 to 16.50
No. 2 Virginia	16.80 to 17.00
No. 2 southern foundry	16.25 to 16.50
Malleable	17.00 to 17.25
Gray forge	15.25 to 15.50

Ferro Alloys.—Consumers of ferro-manganese are showing more interest in their first half requirements and some good-sized inquiries are pending, amounting to about 1,500 tons. One large eastern consumer has been quoted $40, seaboard, on several thousand tons for first half of next year. Sales have been made for deliveries running through the first quarter at $40.50, seaboard. The inquiry for 50 per cent ferro-silicon is small. We quote, 80 per cent ferro-manganese at from $40 to $41, seaboard, covering all deliveries and 50 per cent ferro-silicon at from $57 to $58, seaboard.

Cast Iron Pipe.—Conditions in the south and west are reported to be good and some plants there are running full, but the northern and eastern sections are still only moderately active. Considerable small work is going in the east and there are some light public lettings in New England. Low prices continue to characterize the situation. We quote, 6-inch pipe at from $25 to $25.50, f. o. b. tidewater, in carload lots.

Finished Material.—The sentimental setback which was apparently given the market in the east by the government's move against the railroad freight advances seems less marked, and a more conservative view is being taken of the unfavorable developments. Insistent demands for deliveries continue to be made for steel bars, and the more heavily sold-up products. An increasing tonnage of structural material is coming out and it is estimated that about 175,000 tons is now pending in the country. Of this tonnage, not a large portion is from the railroads. While shape and fabricting business is still subject to keen competition and low prices, the outlook is better.

The railroad contracts of the week were moderate. The King Bridge Co. took 1,900 tons from the Nickel Plate, the McClintic-Marshall Construction Co., 1,500 tons for the Wabash crossing of the Big Four, the Toledo-Massillon Bridge Co., 500 tons from the Toledo & Ohio Central, the American Bridge Co., 250 tons from the Boston & Maine Railroad, and about 250 tons was placed with an independent interest by the Central of New Jersey. The bids for the 18,000 tons for the joint railroad bridge at Louisville are still being considered, as well as 1,000 tons for New York Central Terminal work, in this city, and the tonnage for the freight sheds of this system at Buffalo.

The American Bridge Co. has taken 2,500 tons for a foundry for the General Electric Co., at Erie, Pa., 1,300 tons for the additions to the Dupont building, at Wilmington, Del., and 500 tons for a theatre at Seattle. The Minneapolis Steel & Machinery Co. has received 2,500 tons for a smelting plant for the Chino Copper Co., Chino, Utah; the Phoenix Iron Co., 1,050 tons for the Solvay Process Co., at Detroit, and the Hay Foundry & Iron Works, 600 tons for a building on West 35th street, this city. In Boston the Lawrence building, 1,100 tons, and an addition to the United States custom house, 400 tons, have gone to the New England Structural Steel Co. The Wells-Fargo Express Co., has let 1,600 tons for two buildings at Chicago to an independent shop and in Detroit 600 tons for plant construction for the Ford Motor Car Co. and 400 tons for the Lozier Motor Car Co. have also been secured by independent fabricators. It is understood that the proposals for the 1,500 tons for a bridge at Oil City, Pa., have been rejected.

We quote, New York delivery, as follows:

Angles, 3 to 6 inches x ¼ inch and heavier, 1.66c to 1.71c; beams, 3 to 15 inches, 1.66c to 1.71c; tees, 3 x ¼ inch and heavier, 1.66c to 1.71c; plates, carload, tank, 1.66c to 1.76c; boiler steel, 1.86c to 1.91c; marine boiler, 2.16c to 2.21c; bar iron, 1.45c to 1.50c; soft steel bars, 1.61c to 1.66c.

Rails and Track Material.—The Pennsylvania Steel Co. has taken about 6,000 tons of tee rails for a traction line in Texas through Stone & Webster, Boston. About 600 tons of girder rails for Denver were placed with the same interest. The New York, Westchester & Boston and the Bangor & Aroostook tonnages are still pending.

Old Material.—Buying of scrap is light and prices are low, but the position of the market seems to be a little more promising. The large eastern steel users are consuming greater quantities of scrap in their mixtures than in ordinary practice because of the low cost of this material compared to pig iron. Sellers' yards are not over-burdened with stocks and there is no great pressure to sell at present. Heavy yard steel has sold as high as $14.75, delivered eastern Pennsylvania, and in small lots as low as $14. Some low prices are reported on wrought, particularly yard wrought, or below $16, delivered. Cast is quiet. The government this week sold another lot of Panama scrap, about 900 tons, to a Philadelphia interest at $10.29 per gross ton, tidewater. The bids received ranged from $8.60 to $10.29. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old steel rails (rerolling)	$14.50 to 15.00
Old car wheels	13.50 to 14.00
Old iron axles	21.50 to 22.00
Old steel shafting	16.50 to 17.00
Heavy melting steel	12.50 to 12.75
No. 1 R. R. wrought	14.50 to 15.00
Iron track scrap	14.00 to 14.50
Wrought pipe	12.75 to 13.25
Cast borings	6.50 to 7.00
Wrought turnings	8.00 to 8.50
Heavy cast scrap	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Stove plate	9.50 to 10.00
Grate bars	10.50 to 11.00

BIRMINGHAM, ALA.

Some Quiet Buying and $12 Quotation for Alabama Iron Adhered to.

June 6.

Pig Iron.—The market the past week was characterized by the sale of small lots. The aggregate business transacted, however, was fairly satisfactory and showed continued interest of buyers. During the past three weeks, 30,000 to 35,000 tons of iron have been put on the books of the different furnace interests, which

goes to show there has been some "soft peddle" buying. The bulk of above tonnage was taken by the pipe interests. The railroads of the country have also manifested some real interest in not only the pig iron, but also the finished product market. Whether they will change their attitude on account of the opposition to advancing freight rates, is a question. The furnace interests report that at present their order books are in very good shape—hence there has been some definite decision as to what the base price really is. No sales or quotations are heard of on a lower base than $12 per ton at the furnace for standard Alabama iron. This refers to prompt or nearby shipment. For the last quarter of the year, several of the furnaces are asking $12.50 per ton. Others prefer not to quote at all that far ahead—while still others are disposed to book through the entire year at $12 per ton. The actual condition might be summed up by saying that while the volume of business has been comparatively small, the tone of the market is decidedly better than it has been for the past several months. As to what the immediate future has in store is wholly problematical—particularly considering the fact that just at a time when things were on the up-grade market conditions are liable to receive a set-back on account of the rate agitation going on. Southern charcoal iron is quoted at $22.50 per ton at the furnace.

Cast Iron Pipe.—Manufacturers of cast iron pipe report very satisfactory business in the way of small lots. Local dealers state that no large contracts came up for consideration the past week. Prospects for higher prices look a shade better, so they say, and sufficient tonnage is on their books to keep their plants constantly going for several months yet. Following are prices, per net ton, f. o. b. cars here: Four to 6-inch, $22; 8 to 12-inch, $20, with $1 a ton extra for gas pipe.

Old Material.—There has been some slight improvement in scrap, though not enough to warrant a change in prices. Buyers are evidently showing some interest from the fact that they realize the exceedingly low prices, and are willing to stock and take chances on the future. Following prices, per gross ton, are quoted by local dealers:

Old iron rails	$14.00 to 14.50
Old setel axles	17.00 to 17.50
Old iron axles	18.00 to 18.50
No. 1 R. R. wrought	13.00 to 13.50
No. 2 R. R. wrought	11.00 to 11.50
Dealers' wrought	10.50 to 11.00
Old steel rails	11.00 to 11.50
No. 1 machinery	10.50 to 11.00
No. 1 steel	10.50 to 11.00
Old standard car wheels	13.00 to 13.50
Light castings, stove plate	8.50 to 9.00

No. 2 red ore mine of the Sloss-Sheffield Steel & Iron Co., located on Red Mountain, near Bessemer, Ala., was proclaimed "re-claimed" on Saturday last in a formal way by the officials of the company. Whistles were blown and bells rung in celebration of the event. This mine has been drowned for four or five months, and at times it looked as though it would have to be abandoned.

METAL MARKETS.

ST. LOUIS.

June 6.

Lead and Zinc.—Choice lots of zinc blende brought $46 a ton in the Missouri-Kansas-Oklahoma district last week, with 60 per cent qualities selling for $43 to $40 a ton. The average price for all qualities was $41.07 compared to $40.95 the week before.

The base price for calamine was $24 down to $20 for 40 per cent grades, while a top price of $26 was realized for choice qualities. The average price for the week was $23.40, compared to $25.51 the previous week.

The prevailing price for lead was $49, one dollar a ton higher than was realized the week before. The average price for lead was $48.61, compared to $47.82 for the week before.

The metal markets were a little lower at St. Louis, spelter being offered at 5.10c, compared to 5.17½c for the week before. Pig lead was quoted at 4.22½c, compared to 4.25c for the previous week.

CHICAGO METAL MARKET.

June 7.

New Metals.—This has been another quiet week in new metals, and prices have not varied to any great extent. Spelter has been a little weak, and a quiet condition in the old market has resulted in slight concessions.

We quote as follows: Lake copper, carload lots, 13⅛c to 13¼c; casting, 12⅞c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.10c to 5.15c; lead, desilverized, 4.20c to 4.25c, in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 33¾c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—The past week has been a very dull one in scrap metals. Railroads are reported to be buying very sparingly and the effect of the injunction procedure, over the matter of advancing freight rates, is very clearly seen in this line. Prices are nominally unchanged.

We quote, dealers' selling prices, as follows:

Copper wire, 12½c; heavy copper, 12½c; light copper, 10½c; heavy red brass, 11¼c; heavy yellow brass, 9¼c; light brass, 6¾c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8½c; tea lead, 3½c; lead scrap, 3¾c; zinc, 3¾c; tin pipe, 30c; tin foil, 27½c; pewter, 22c; electrotype plates, free from wood, 4¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $76 per ton.

NEW YORK.

June 7.

Copper.—Pending the publication of the report of the Copper Producers' Association next week, the copper metal market has been quiet. Buyers are not inclined to come into the market until the figures have been made public, and outside of the Amalgamated interests there is but a small amount of copper offered. Consequently but slight changes in prices have taken place. Such changes as have been noted have resulted in a reduction of from 15 to 20 points from the high level of last week. This decline, however, may be attributed to sympathy with the extensive fall in stock market values throughout the country, rather than to a change in any integral conditions of the copper trade. The Amalgamated Copper Co. and other large producers are still asking 13c for electrolytic, but sales have been made by some interests as low as 12.70c f. o. b. New York. Casting is quoted at 12.50c to 12.62½c, and lake at 12.87½c to 13c. Exports since June 1 aggregate 2,192 tons, and imports slightly over 2,500 tons, for the same period.

Tin.—Improvement in the demand for spot and June pig tin developed on the decline to 32.65c, and the prices of these two contracts have advanced from that level to 33.10c in New York. The United States Steel Corporation, which had been a seller of tin on strong markets up to a week ago, has reversed its open position and has appeared as a buyer during the past week, both in the local and foreign markets. The selling of spot and nearby tin, done for this interest late in May, when there was some danger of a squeeze, gives the character of manipulation to those transactions—

done for the purpose of holding prices down, and thereby facilitating the buying of pig tin for its consumption needs. Prices today are as follows: Spot and June, 33.10c, and July 32.80c bid, offered at 32.90c.

Lead.—The market for pig lead is quiet, and prices are unchanged. Spot and June are quoted at 4.30c to 4.37½c in New York by independent holders and offered at 4.40c for shipment by the leading interest.

Spelter.—The same undecided price conditions prevail as were reported last week. Inquiries are met with quotations, ranging from 5.20c to 5.50c in New York. No sales, however, have been noted under 5.40c in New York.

Antimony.—The market is unchanged in every sense. Cookson's, 8.25c; Hallett's, 8.12½c, and Hungarian, 7.37½c.

BUILDING NEW STACK.

Warwick Iron & Steel Co. Has Begun Active Construction.

The Warwick Iron & Steel Co. has begun the construction of a modern new blast furnace at its plant at Pottstown, Pa. The foundations are now being put in and the iron and steel work, for which the plans have been practically completed by Frank C. Roberts & Co., Philadelphia, the engineers in charge of the construction, will shortly be inaugurated. The work includes a new stack, new skip-hoist and the re-arrangement of the present bins.

The new stack will be strictly modern in design, of about 400 tons daily capacity and will be located alongside the present No. 1 stack. It will be known as furnace A, and eventually it may replace one of the present three stacks of the company in this group. The new furnace will be making iron in about six months. The equipment of blowing engines and stores now at the plant will be utilized for the new capacity.

ST. LOUIS SHIPMENTS.

Receipts and shipments of pig lead and spelter at St. Louis for the last two weeks were as follows:

	Zinc and spelter.	Pigs of lead.
Receipts—		
For week ending May 28.....	80,700	56,470
For week ending June 4.....	81,960	36,620
Shipments—		
For week ending May 28.....	80,400	49,420
For week ending June 4.....	83,540	19,880

Etowah No. 1 stack of the Alabama Consolidated Coal & Iron Co. was blown out, May 16, for light repairs, but was relighted, June 3.

MANGANESE ORE

Again Being Received by Corporation From Russia.

For the first time in six or seven years, the United States Steel Corporation is again obtaining a considerable portion of its needs of manganese ore from the Russian sources of supply. One cargo of 6,000 tons of this ore has already been received at Baltimore on board the vessel Royal Scepter, while chartering of the steamers Kobe and Maria, with 6,600 and 5,800 tons respectively, has been done at rates of 15 shillings Several other cargoes are expected to come in soon.

The Corporation formerly received a large part of its manganese ore from Russia, but of recent years it has been filling its needs of this ore from India and Brazil. The ore is used by the Carnegie Steel Co. in the manufacture of ferro-manganese and spiegeleisen in the Pittsburg district. Other steel companies are occasionally purchasers of foreign manganese ore.

FEW LOCOMOTIVE ORDERS ARE PLACED.

Locomotive orders the past week have been few, the principal ones reported being six locomotives for the Northwestern Pacific railroad. The American Locomotive Co. reports the following orders taken in the week:

Northwestern Pacific Railroad.—Four 10-wheel passenger locomotives (460 type), cylinders 63 inches, driving wheels 20 x 26 inches; total weight, 168,000 pounds. Two 6-wheel switching locomotives (060 type), cylinders 51 inches, driving wheels 19 x 24 inches; total weight, 120,000 pounds.

Czarnikow-Rionda Co.—One Mogul freight locomotive (260 type), cylinders 54 inches, driving wheels 19 x 24 inches; total weight, 113,000 pounds.

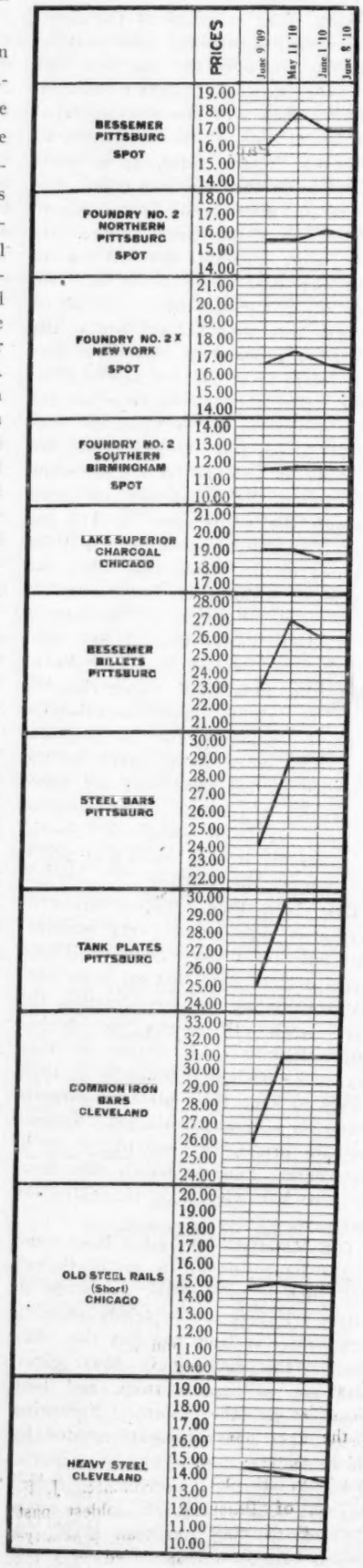
Belmina Consolidated Asbestos Co.—One 4-wheel saddle tank locomotive (040-T type), cylinders 29 inches, driving wheels 9 x 14 inches; total weight, 24,000 pounds.

B. T. Babbitt.—One 4-wheel saddle tank switching locomotive (040-T type), cylinders 33 inches, driving wheels, 11 x 16 inches; total weight, 38,000 pounds.

ROANOKE RE-ROLLING MILL HAS BEEN SOLD.

The rolling mill of the Loucks Iron & Steel Co., Inc., at Roanoke, Va., has been sold to a company represented by James S. Hagan, of Philadelphia. It is proposed by the new owners to continue re-rolling steel rails under a patent controlled by them. The mill was built and first put in operation in 1892, and overhauled in 1906-7. Its equipment includes 15 double puddling furnaces, one 12-by 35-foot continuous rail-heating furnace, and three trains of rolls.

PRICE CHART



IN LARGE NUMBERS

FOUNDRYMEN ASSEMBLE AT DETROIT CONVENTION.

Highly Creditable Display of Foundry Supplies and Equipment—Reading of Papers—Boat Ride and Other Entertainment Features.

Detroit, June 7.—What promises to be the most largely attended meeting ever held by the American Foundrymen's Association and allied organizations, convened this morning in the Michigan building at the State Fair Grounds. More than 1,000 foundrymen from every section of the United States and Canada have already registered, and hundreds of visitors are arriving on every train. This is the fifteenth convention held by the parent society and the interest manifested foreshadows still greater advancement in foundry practice in the future than has been recorded in the past. The exposition of foundry supplies and equipment, which is being conducted in three large buildings and a tent on the fair grounds, and which covers practically double the floor space of any previous exhibit, is attracting well-deserved attention. Many of the molding machine displays are on a much larger scale than heretofore attempted, and the variety of these labor-saving devices for making molds for castings weighing from a few ounces to thousands of pounds is indicative of the heavy demand that exists for cost-reducing equipment among American casting plants. The exposition, held under the auspices of the Foundry and Manufacturers' Supply Association, was formally opened Monday morning, and despite the inclement weather, the buildings were crowded throughout the day.

To the members of the Detroit Foundrymen's Association and the local committees, great credit is due for the complete arrangements for the reception and entertainment of the visitors. No detail has been overlooked and the foundrymen are assured of an enjoyable and pleasant week in the beautiful City of the Straits.

The opening session, Tuesday morning, was conducted jointly by the American Foundrymen's Association and the American Brass Founders' Association. Addresses of welcome were delivered by Mayor Breitmeyer and President Larned, of the board of commerce. Both expressed surprise over the extent of the exhibit and the large attendance. J. S. Seaman, of Pittsburg, the oldest past president of the American Foundrymen's Association, was called upon to respond. He said that he had had the pleasure of attending all of the meetings of this society, but he did not believe that the convention was ever held in any city where a more liberal welcome was extended than by Detroit. Arthur T. Waterfall, president of the American Foundrymen's Association, in his address, called attention to the wonderful progress that has been made in foundry practice during the last 12 months. The development of the permanent mold he characterized of prime importance to the gray iron founder, while the electric furnace, he said, would revolutionize latter-day melting practice. In closing, he stated that the resolution to increase the annual dues from $5.00 to $10.00 had carried by an overwhelming majority.

W. R. Webster, of the American Brass Founders' Association, in his presidential address, directed attention to the limited amount of information obtainable today on the art of casting the non-ferrous metals and pointed out the need of classified data for the aid of the brass foundryman. W. M. Corse, secretary-treasurer of this organization, reported an increase in membership from 206 to 273 during the year. The committee on Standardization of Alloys, he stated, had been working with the United States Bureau of Standards and he suggested that the committee cooperate with the American Chemical Society and the American Society for Testing Materials. He added that an effort is also being made to obtain a definition of trade terms pertaining to the non-ferrous metal casting industry.

Secretary's Report.

Dr. Richard Moldenke, secretary-treasurer of the American Foundrymen's Association, in his annual report, briefly discussed foreign foundry practice, and called attention to some of the differences between methods prevailing in casting plants abroad and in the United States. Secretary Moldenke made two trips to Europe during the last twelve months, and his investigations showed that in Germany the castings are produced entirely for the work intended, regardless of any objections that might be made by the machine shop against hard castings. If castings of good wearing qualities are required, excessive machine shop costs are not considered. In this country, on the other hand, the demand is constantly for soft castings that can be machined readily, wearing qualities being thereby sacrificed.

The report showed a membership enrollment of 753, a decided increase during the year. The dues are to be increased to $10 per annum, the members having decided in favor of this advance from $5.00, by an overwelming majority. The gross increase during the year amounted to $2,968.64 and the balance in the treasury is $20.28. The increased dues will provide funds to defray the expense of furnishing each of the members a bound volume of the society transactions, and in addition this organization will be in position to carry on research work, which cannot now be undertaken.

The financial report presented by Dr. Moldenke showed an expenditure of only $900 during the year for salaries, and in view of the fact that a salary of $1,200 is allowed by the association, J. S. Seaman suggested that the executive committee be instructed to insist upon the acceptance by Dr. Moldenke of his unpaid salary for the year. A resolution presented by Major Joseph T. Speer, of Pittsburg, to petition President Taft to appoint Dr. Joseph A. Holmes director of the newly created Bureau of Mines was carried and the secretary was instructed to telegraph the President the sentiment of the members of the American Foundrymen's Association. The meeting closed with an exceedingly interesting paper and demonstration of the oxy-acetylene cutting and welding process by Steelman Stephenson.

Afternoon Session.

The first paper presented at the afternoon session of the American Foundrymen's Association was entitled "Foundry Efficiency," by Benjamin D. Fuller, superintendent of the Westinghouse Electric & Mfg. Co., Cleveland. This was followed by a paper on "The Personal Equation in Accidents," by Thomas D. West. This meeting closed with an illustrated lecture on "Autogenous Welding," by Henry Cave, Springfield, Mass. At the meeting of the American Brass Founders' Association, W. R. Sperry, Bridgeport, Conn., read a paper on "Fluxes as Applied to the Brass Foundry."

Smoker and Theater Party.

On Tuesday evening, a smoker was given by the Detroit Foundrymen's Association to the members of the allied organizations at the Light Guard Armory and the ladies attended the Temple Theater. A boat ride on the Detroit river is scheduled for Wednesday afternoon, while on Thursday evening the members of the Foundry and Manufacturers' Supply Association will tender a dinner to the officers of the Detroit Foundrymen's Association and affiliated organizations at the Hotel Cadillac. The closing sessions of the convention will be held Friday morning.

The Banquet.

On Monday evening, the officers of

the allied foundry associations and representatives of the technical press were tendered a banquet at the Hotel Ponchartrain, by the members of the Detroit Foundrymen's Association. Walter S. Russell presided, and toasts were responded to as follows: "The Detroit Foundrymen's Welcome," Dr. Frank T. F. Stephenson; "The American Foundrymen's Association," Arthur T. Waterfall and Jos. T. Speer; "The Foundrymen's Questions," Dr. Richard Moldenke; "The American Brass Founders' Association," W. R. Webster; "The Foundry and Manufacturers' Supply Association," F. N. Perkins; "The Associated Foundry Foreman," Eugene Smith; "The Detroit Foundrymen's Association," J. J. Wilson; "Our Canadian Cousins," L. L. Anthes.

LATE RAIL SALES.

New York, June 8. (By wire.)

The Illinois Steel Co. during the week made sales of 24,000 tons of open-hearth rails, including one lot of 19,000 tons to a western line, and 4,000 tons of Bessemer. The Carnegie Steel Co. has booked 800 tons from a southwestern New York traction company and 500 tons from the New Orleans Railway & Light Co.

The Lackawanna Steel Co. has sold 11,000 tons of rails to the Great Northern and 5,500 tons to the Canadian Northern. It has also booked 5,000 tons of ferro-titanium Bessemer rails for the Chicago, Burlington & Quincy.

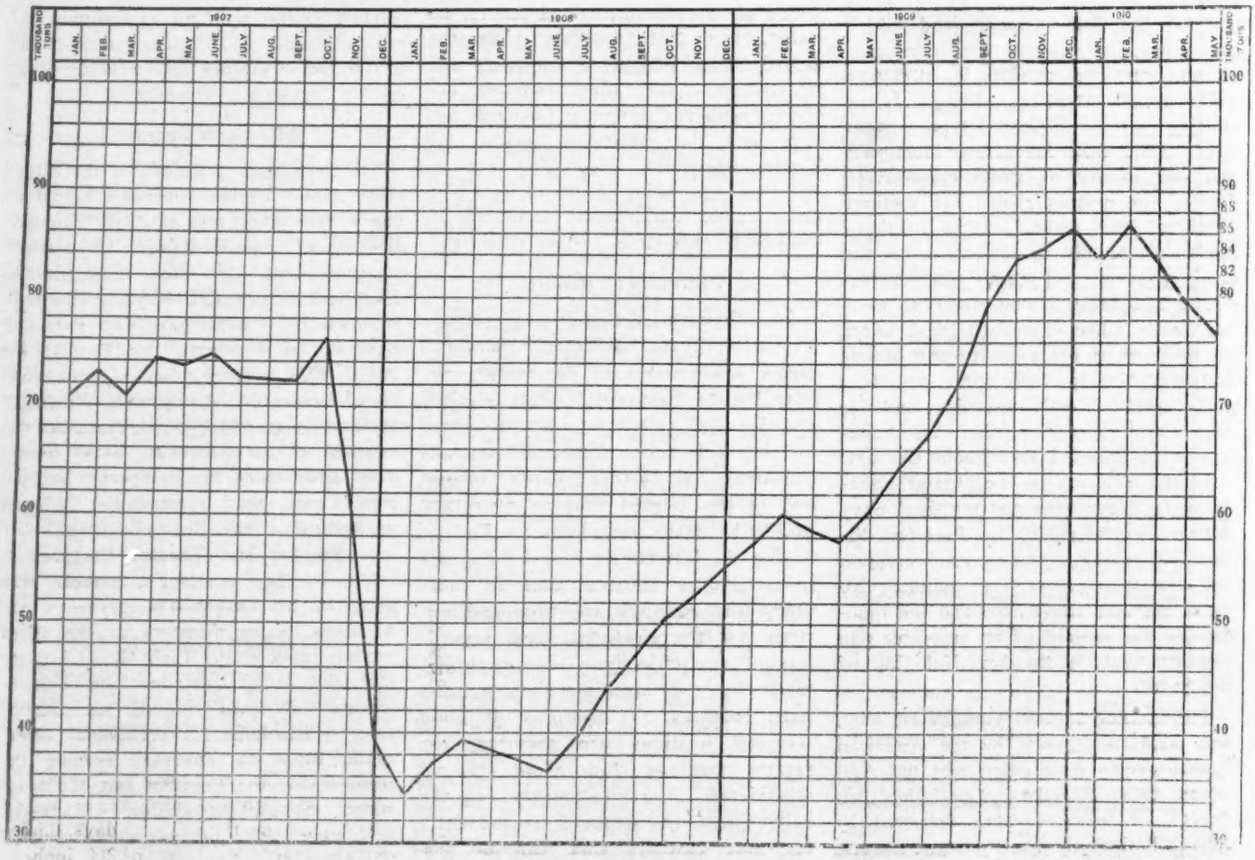
THREE COKE CONCERNS

Have Been Merged—New Ovens Are Being Constructed.

Three of the largest coke companies in the Connellsville region are to be merged and the company will be known as the Thompson-Kuhn Coke Co. The three companies are the Thompson-Connellsville Coke Co., of which J. P. Brennen is president; the Tower Hill-Connellsville Coke Co., of which L. W. Fogg is president, and the Isabella-Connellsville Coke Co., a new concern which recently purchased 2,000 acres of coal in the lower Connellsville region, and is building 2,000 new ovens. Later, it is intended to include four other coke companies in the merger. J. S. and W. S. Kuhn, of Pittsburg; J. V. Thompson, of Uniontown, Pa.; J. R. Nutt, Frank M. Osborne and Andrew Squire, of Cleveland, are prominent in the merger of these companies. The new concern will take over about 6,600 acres of fine coking coal. The three companies now have in operation about 1,500 ovens, and at present are building, 1,500 more.

The Thomas Furnace Co., Milwaukee, ran the furnace which it had in blast in May for three months without making a single cast above 0.050 per cent in sulphur.

DAILY AVERAGE PIG IRON OUTPUT



The fluctuations in the average coke and anthracite pig iron output of the country for a series of years are graphically shown in the above chart. The high point of production, as shown in the daily average output, was reached in February, with its daily average of 86,747 tons. The chart line showing steady reduction in the daily average shoots downward to 76,607 tons in the month just closed. Although this would seem to be a sharp reduction in production, yet a glance at the line representing the average daily output for 1907 shows that even the reduced May output is still higher than the high point reached in the boom year of 1907.

CURTAILMENT NOT SO LARGE AS EXPECTED

The curtailment of the pig iron production of the country, which has been in progress for the past two months, continued as shown by the production returns for the month. The total output of the coke and anthracite blast furnaces of the country in May was 2,374,802 tons, compared with 2,477,700 tons in April, although the month had one less working day. This shows a decrease in production in May of 102,898 tons, a smaller reduction of output than in April, when 111,036 tons less were produced than in March. The average daily production in May was 76,607, compared with 82,590 tons in April.

AVERAGE DAILY PRODUCTION.

	1910.	1909.
January	83,871	57,683
February	86,747	60,088
March	83,508	58,793
April	82,590	57,687
May	76,607	60,218
June	.....	64,334
July	.....	67,375
August	.....	72,021
September	.....	79,186
October	.....	84,001
November	.....	84,425
December	.....	86,539

The returns for May show that the number of stacks active on the last day of the month was 278, compared with 292 on the last day of April, a loss of 14 from the active list. This compares with a loss of 18 in April from the active list. In May, ten merchant stacks blew out one merchant stack was banked. However, since the first of June two more merchant stacks have been lighted. The curtailment in the number of active stacks between April 1 and May 31 was 32.

MONTHLY PRODUCTION.

	1910.	1909.	1908.
January	2,599,995	1,788,164	1,043,374
February	2,428.937	1,682,470	1,086 809
March	2 588.736	1,822,644	1,239,856
April	2,477,700	1,730,608	1,155,122
May	2,374,802	1,866,757	1,168,002
June	.....	1,9 0.029	1,106,300
July	.....	2,088.620	1,228,604
August	.....	2,232,642	1,366,019
September	.....	2,375,589	1,416 252
October	.....	2,604,037	1,573,824
November	.....	2,532,740	1,582,314
December	.....	2,682,702	1,723,664
Total	12,470,170	25,337,002	15,680,140

The output of merchant iron in May was 761,381 tons, compared with 817,483 tons in April, a reduction in May of 56,102 tons. The non-merchant or steel plant production in May was 1,581,024 tons, compared with 1,633,006 tons in April, a loss of 51,982 tons in May.

The production of spiegel in May also showed a loss of 2,544 tons, the production in May being 13,081 tons, and in April 15,625 tons. The output of ferro, however, in May showed a gain of 7,740 tons, being 19,326 tons in May, and 11,586 tons in April.

Several records were made by Tennessee Coal, Iron & Railroad Co. blast furnaces in May: The monthly record of No. 4 Bessemer being 7,779 tons, its best previous output being 6,538 tons in December, 1908; No. 2 Ensley, 10,974 tons, surpassing its best previous record of 10,806 tons in March, 1910.

MAY BLAST FURNACE REPORT.

STATES.	NO. OF STACKS.	NO. IN BLAST ON LAST DAY OF MONTH. MAY.	APR.	ACTUAL TONNAGE MAKE. MERCHANT.	NON-MERCHANT.	TOTALS. MAY.	APR.
Pennsylvania	157	114	118	233,782	707,526	941,308	967,348
Ohio	69	50	52	167,937	316,376	484,313	541,253
Alabama	46	22	25	115,876	48,372	164,248	172,730
Virginia	24	12	13	43,211	———	43,211	43,428
New York	26	17	17	63,431	107,906	171,337	171,517
New Jersey	9	4	5	22,977	———	22,977	29,092
Illinois	26	22	22	33,344	223,685	257,029	260,386
Colorado	6	4	4				
Indiana	8	7	7	14,569	158,144	172,713	167,365
Maryland	4	4	3				
Wisconsin	6	2	3				
Kentucky	7	2	2				
West Virginia	4	2	2	44,067	19,015	63,082	75,630
Tennessee	18	12	13				
Georgia	2	1	1				
Texas	3	0	0				
Minnesota	1	1	1	22,187	———	22,187	21,740
Michigan	2	2	2				
Missouri	1	1	1				
Spiegel—All states.						13,081	15,625
Ferro—All states.						19,326	11,586
Total	419	278	291	761,381	1,581,024	2,374,802	2,477,700

RECORD MOVEMENT

For Month of May Made by Vessels in the Ore Trade.

Ore shipments during May were a surprise to the trade. Lassitude marked the early days of the month, vessels simply knocking about the harbors, and yet the movement of ore was in excess of some of the banner months of a year or more ago. This is conclusive evidence of the capacity of the lake fleet, especially so as wild vessels had trouble in getting cargoes during the whole month. The May movement of ore was 6,081,358 tons, making the total movement to June 1 7,601,665 tons. This May movement constitutes the record for that month. During May of last year, 3,253,275 tons were moved, or 3,309,068 tons up to June 1. The movement to June 1 this year, therefore, is 4,292,597 tons ahead of last year.

The shipments by ports follow:

	May, 1909. Gross tons.	May, 1910. Gross tons.
Escanaba	337,734	749 091
Marquette	133,097	481,325
Ashland	232,184	588,604
Superior	608,515	955,651
Duluth	1,215,925	2,220,758
Two Harbors	725,820	1,085,929
Total	3,253,275	6,081 358
1910 increase		2,828,083

	To June 1, 1909.	To June 1, 1910.
Escanaba	384.856	972,117
Marquette	133,097	616,885
Ashland	240,855	807,307
Superior	608,515	1,310,958
Duluth	1,215 925	2,530,185
Two Harbors	725,820	1,364,213
Total	3,309,068	7,601.665
1910 increase		4,292,597

STARTED NEW FURNACE.

The Republic Iron & Steel Co. this week started one of its new lap-weld furnaces at the Youngstown tube plant and it is expected that the others will be started about July 1. This company has been successfully operating its butt-weld furnaces at the Youngstown plant for the last 30 days, making steel pipe from ⅜ to 2½ inches, in both black and galvanized. The company recently booked some fairly good orders for pipe and steady operation of its pipe mills for sometime is assured.

DEATH OF E. C. HEGELER, PIONEER ZINC MANUFACTURER.

The death of Edward C. Hegeler, one of the most progressive pioneer zinc manufacturers of the country, occurred June 4, at La Salle, Ill., after a short illness with pneumonia. Beside aiding in developing the art of spelter distillation and further manufacture of zinc into useful products, Mr. Hegeler was actively identified with public affairs in the community and state where he resided.

He was born in Germany, and in 1857, in company with F. W. Matthiessen, both of whom had just come to the United States from the Freiberg, Saxony, school of mines, he carried to a successful issue experiments in distilling spelter with anthracite at the Friedensville, Pa., plant, near South Bethlehem, where the Lehigh Zinc Co. had abandoned the attempt. When the young Germans found it impossible to secure a satisfactory arrangement with the Lehigh company because of the financial crisis, they went to Wisconsin and studied the zinc deposits there. In 1858, they began the construction of zinc works at La Salle, choosing that location because midway between the Wisconsin ore mines and the Illinois coal fields. The works were placed in operation in 1860 and have continued operating ever since.

Of Mr. Hegeler, it has been said: "He was practically the only one of the early zinc metallurgists who displayed noteworthy originality." He early turned his attention to gas firing, leading to the invention of various labor-saving devices. In 1881, he invented the roasting furnace which lead to sulphuric acid becomng a by-product of blende roasting. Since 1868, the Matthiessen & Hegeler Zinc Co. had practically a monopoly of zinc sheet manufacture.

Edmund H. McCullough, aged 61, president of the Westmoreland Coal Co. and the Penn Gas Coal Co., with offices in Pittsburg and Philadelphia, died, May 31, at Philadelphia.

Joseph Edward McAleese, assistant secretary of the Ft. Pitt Forge Co., and chief clerk of the Pittsburg Screw & Bolt Co., died, June 1, at the family residence in Forty-fourth street, Pittsburg.

W. H. Slaughter, formerly secretary and treasurer of the Louisville & Jeffersonville Bridge Co., which constructed a bridge across the Ohio river at Louisville, Ky., is dead. He was 70 years old. Death was due to heart disease.

Samuel Willis, for many years identified with the ship building industry of Long Island, N. Y., and its vicinity, died May 31, aged 85. His father was a ship builder and, when a boy, Mr. Willis was apprenticed to his trade. He retired from active business about 15 years ago.

Alfred John Greathead, who was connected with the firm of John A. Roebling's Sons Co., died from pneumonia at his residence in Chicago, May 21, after a week's illness. During the last 23 years, Mr. Greathead had acted in the capacity of secretary of the company. He was born at Barnstaple, in 1861.

Joseph S. Harris, former president of the Philadelphia & Reading Railroad Co., died unexpectedly, June 2, at his home in Germantown, a suburb of Philadelphia, from apoplexy, aged 74. He had been prominently identified with the anthracite business for 40 years, and was connected officially with many corporations in Philadelphia and eastern Pennsylvania.

PERSONAL.

Albert Broden, superintendent of furnaces of the Reading Iron Co., will spend the summer abroad.

Charles M. Schwab, president of the Bethlehem Steel Corporation, has sailed by the Mauretania for a short stay in Europe.

Frank Frances, who has been with the Penn Steel Casting Co., Chester, Pa., has been appointed superintendent by the Chester Steel Casting Co.

Frederick W. Sivyer, president of the Northwestern Malleable Iron Co., Milwaukee, is reported dangerously ill and fears are being expressed as to his recovery.

F. H. Hinsdale, construction superintendent for the Stone & Webster company, at Seattle, has accepted a position with the Raymond Concrete Pile Co., of Chicago.

Charles Munson, after an absence of three years owing to ill health, has returned to Beloit, Wis., and has again taken up his duties as manager of the Charles H. Besly & Co. factory.

Thomas Blagden, who has been attached to the selling staff of the Pennsylvania Steel Co. at New York, has been promoted to assistant sales agent in New England, with headquarters at Boston.

H. F. Meserve, who was recently mentioned prominently for the presidency of the Alabama Consolidated Coal & Iron Co., has become a member of the banking firm of Middendorf, Williams & Co., of Baltimore. As a representative of Baltimore interests, Mr. Meserve recently made a close inspection of the properties of the Alabama Consolidated company.

Samuel Chandler has resigned as New York representative of the Belmont Iron Works and is now connected with the Lackawanna Steel Co., with offices at 2 Rector street, New York City.

RECEIVER NAMED

For Bon Air Coal & Iron Co., of Nashville, Tenn.

Nashville, Tenn., June 8. (By wire.)

An attempt to reorganize the Bon Air Coal & Iron Co. has failed, and to prevent unfriendly litigation a friendly suit was begun last Friday here. A receiver was asked for to give the company a chance to organize, and Clerk and Master Robert Vaughn was made receiver. The purpose of the attempted reorganization was to raise $150,000 to pay off improvement and expenditure bonds held by the Union Bank & Trust Co. Only enough stockholders, however, signed the option to raise $130,000. On outstanding judgment for $125,000 against the company in the courts of Maine was largely responsible for the hesitancy of stockholders entering the option agreement.

LOW PRICES FOR FOUNDRY AND BASIC PIG.

Pittsburg, June 8. (By wire.)

Late developments indicate that the price paid by the Westinghouse Air Brake Co. for foundry iron this week was on an average of $14.50, valley. Correspondingly low prices have been quoted on other inquiries for foundry iron now pending. The sale of a small lot of Bessemer iron for June, July and August delivery on a basis of $16, valley, is noted, and it is not believed that this price can be shaded at present. A consuming interest in this district has succeeded in picking up a small lot of basic iron for prompt shipment on a basis of $14.75, valley.

BLOWS IN STACK.

Another furnace of the United States Steel Corporation has been blown in at New Castle group of the Carnegie Steel Co. The going furnace capacity for the different subsidiaries of the Corporation is now represented by 90 stacks out of a total of 119.

Injunction Suit Weakens Markets

Last week in the stock market was one of large sales and rapid declines in prices. Many low records for the year were made and at some periods in the week the market was almost in a state of demoralization.

Monday was a holiday. Tuesday it was announced that the government had taken proceedings against the railroads in the Western Traffic Association to restrain them from advancing railway rates, on the ground that the advance was in violation of the Sherman auti-trust law, and stocks broke violently. Grain markets were weak and lower. Wednesday the market opened weak and continued to decline. Cotton was lower, and the foreign markets declined in sympathy with the American market. Thursday, the market opened weak and lower, but recovered somewhat and closed steadier. Sterling exchange was lower, and the Bank of England reduced its minimum discount rate from 4 to 3½ per cent. Cotton was weaker and grain lower. The Central Traffic Association and eastern railroads filed notice of increase in freight rates. Friday the market was weak, and prices declined 3 to 6 points. The total sales amounted to 1,502,000 shares, of which over 300,000 were United States Steel common. Congress passed the new railroad bill. Calumet & Hecla reduced the quarterly dividend from $8 to $7 a share. Saturday, 640,000 shares were dealt in during the two-hour session, and prices continued to fall. The railroads arranged for a conference with the president on the rate question. Money throughout the week was easier, ranging from 3½ to 2½ per cent. Time money was in fair demand for the longer periods.

Clearings throughout the United States were estimated at $3,174,518,924, against $2,966,805,749 the week before, and $2,916,487,692 for the corresponding period of the year before. The actual report of clearing house banks showed loans decreased $1,536,600; deposits decreased $5,111,100; surplus decreased $2,821,800, and the ratio of reserve 26.9, against 27 the week before. Trust companies and non-member banks showed loans and investments decreased $1,338,900; total deposits increased $12,534,500, and the percentage of reserve 17.1, against 17.7 the week before. Exports of gold from New York, according to the custom house report, were $226,600; imports amounted to $146,721.

Failures during the month of May numbered 887, with assets reported at $5,102,192, and liabilities at $13,318,561, against the failures of May, 1909, numbering 902, with assets of $6,636,358, and liabilities of $13,241,119. The report of the American Railway Association shows that there was a reduction in the surplus equipment during the fortnight ending May 15 which left a net surplus of 110,661 cars, against 122,593 cars for the two weeks next preceding. The whole number of shares dealt in on the New York stock exchange amounted to 4,953,000, against 2,033,250 the week before, and 5.336,964 the corresponding week of 1909. Bonds, other than government bonds, were dealt in to the value of $11,304,000, against $6,274,000 the week before, and $34,323,000 the corresponding week of the year before.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo- June 4	Changes in week	Annual Mortgage Date	1910	Stock Outstanding	Basis	Dividend Last Dividend	Date Last Div. Pay.
Allis-Chalmers	8½	— ⅞			$19,820,000		.....	.....
Allis-Chalmers, pr	31¾	— ¾			16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	9	— ⅞	Feb.	2	41,233,300		1¾ Q.	.....
American Can, pr	70½	—2½			41,233 300	7 cum	1¾ Q.	Apr., 1910
Am. Car & Fdy	53	—8½	June	24	30,000,000		½ Q.	Apr., 1910
Am. Car & Fdy., pr	113½	—2½			30,000,000	7 n. c.	1¾ Q.	Apr., 1910
American Loc	41½	—7	Oct.	18	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	104½	—5½			25,000,000	7 cum.	1¾ Q.	Apr., 1910
American Ship	79½	—3½	Oct.	12	7,600,000	4	1 Q.	Mar., 1910
American Ship, pr	110¼	—1¼			7,900,000	7 cum.	1¾ Q.	Jan., 1910
Am. Steel Foundries (new)	49½	—5½	Dec.	1	17,184,000		1¾ Q.	.....
Barney & Smith	30	.....	June	7	2,000,000	4	.....	Sept., 1907
Barney & Smith, pr	100	.....			2 500,000	8 cum.	1 Q.	June, 1908
Bethlehem Steel	25	—3½	April	5	14,862,000		.....	.....
Bethlehem Steel, pr	53	.....			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	45	—2½	Mar.	15	45,000,000	5	1½ Q.	May, 1910
Cambria Iron	45	.....			8,468,000*	4	2 S. A.	Apr., 1910
Chicago Pneumatic Tool	38½	—3½	Feb.	21	6,145,000	4	1 Q.	Apr., 1910
Colorado Fuel	33½	—4	Oct.	17	34,235,500		1¾ Q.	April, 1902
Crucible Steel	12½	— ⅝	Oct.	19	24,578,400		3½.	.....
Crucible Steel, pr	83	—2½			24,436,000	7 cum.	1¾ Q.	Mar., 1910
Empire Steel	81½	.....	Feb.	23	1,254 770		.....	.....
Empire Steel, pr	68	—2			2,500,000	6 cum.	3 S. A.	July, 1909
Fay & Egan	70	.....	Feb.	15	1,000,000	7	3 S. A.	Feb., 1910
Fay & Egan, pr	115	.....			1,000,000	7 cum.	1¾ Q.	Nov., 1909
General Electric	141	.....	May	10	65,179,600	8	2 Q.	July, 1910
Harbison-Walker	33¾	—1¼	Jan.	17	18,000,000		½ Q.	June, 1910
Harbison-Walker, pr	94	.....			9,600,000	6 cum.	1½.	Apr., 1910
International Pump	45	—2¾	May	10	17,762,500		1 Q.	Apr., 1905
International Pump, pr	81½	—4			11,350,000	6 cum.	1½ Q.	May, 1910
Lackawanna Steel	45	.....	Mar.	9	34 978,000		.....	.....
Lake Sup. Corp	21	—1	Oct.	5	40,000,000		.....	.....
New York Air Brake	61	—13	June	16	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	98	.....	Feb.	2	8,500,000	6	1½ Q.	May, 1910
Niles-Bement-Pond, pr	104	.....			2 000,000	6 cum.	1½ Q.	May, 1910
Otis Elevator Co	54	.....	Mar.	21	10,000,000	3	1½ S. A.	Oct., 1909
Otis Elevator Co., pr	96	—1			6,500,000	6 n. c.	1½ Q.	Jan., 1910
Pa. Steel	65	.....	May	9	10,750,000		.....	.....
Pa. Steel, pr	103	—5			16,500,000	7 n. c.	3½ S. A.	May, 1910
Pittsburg Coal Co	18	—2	Mar.	8	28,104,600		.....	.....
Pittsburg Coal Co., pr	63	—8			27,071,800	7 cum.	1¾ Q.	Apr., 1910
Pressed Steel Car	32¾	—5¾	Feb.	16	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	95	—4			12,500,000	7 n. c.	1¾ Q.	May, 1910
Pullman	160	—1¼	Nov.	9	120,000,000	8	2 Q.	May, 1910
Railway Stl. Spring	32½	—7½	Mar.	3	13,500,000	2	1 S. A.	Oct. 1908
Railway Stl. Spring, pr	100	—2½			13,500,000	7 cum.	1¾ Q.	June, 1910
Rep. Iron & Steel	27⅞	—5⅞	Oct.	19	27,191,000		.....	.....
Rep. Iron & Steel, pr	94	—3½			20,416,900	7 cum.	1¾ Q.	July, 1910
Sloss-Sheffield	69	—4¼	Mar.	9	10,000,000	5	1¼ Q.	June, 1910
Sloss-Sheffield, pr	118¼	.....			6,700,000	7 n. c.	1¾ Q.	Apr., 1910
U. S. Pipe & Fdy. Co	19½	—3½	June	22	12,106,300	2	1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	69	—3¼			12,106,300	7 n. c.	1¾ Q.	Mar., 1910
U. S. Steel	76⅝	—5⅛	April	18	508 302,500	4 n. c.	1¾ ‡ Q.	Oct., 1909
U. S. Steel, pr	115¼	—2¾			360,281,100	7 cum.	1¾ Q.	Oct., 1909
U. S. Steel, 5s	103	—1			463,798,000	5	.....	Jan., 1910
Va. Iron, Coal & Coke	58	.....	Sept.	20	9,073,680		.....	Mar., 1910
Westinghouse Elec	59½	—4½	July	27	27,173,200*		1¾ Q.	Mar., 1910
Westinghouse Air Brake	135½	—2	Oct.	4	14,000,000*		5 Q.	Apr., 1910

Par value of shares $100, except those starred (*), $50.
‡Includes ¼ per cent extra.

Copper Stocks.

New York.—Amalgamated Copper closed 64, a decrease of 5¾.

Boston.—Butte Coalition closed 18, a decrease of 2; Calumet & Arizona closed 61, a decrease of 2½; Calumet & Hecla closed 560, a decrease of 30; North Butte Mining closed 30¼, a decrease of 3¼; Quincy Mining closed 74¾; a decrease of ¾.

Financial Notes.

Ingersoll-Rand & Co. has declared a 3 per cent semi-annual dividend on the preferred stock, payable July 1.

The Calumet & Hecla Mining Co. has declared a quarterly dividend of $7 per share, payable June 28.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND.

BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Blk.
CINCINNATI.....11 Blymyer Bldg.
NEW YORK.....1115 West Street Bldg.
PITTSBURG.....510 Park Bldg.
SEATTLE.....942 Henry Bldg.
WASHINGTON, D. C.....Post Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. The price of copies issued three months or more previous to date of current issue will be 25 cents each. Advertising rates furnished on application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co. will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP.

COPYRIGHT 1910 BY PENTON PUBLISHING CO.

THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January, 1910	5.681
February	5,703
March	5,754
April	5,793

June 2, 1910

THE RAILROADS AS IRON AND STEEL BUYERS.

Although the announcement that President Taft has come to an amicable agreement with the railroads in regard to raising freight rates will be received with great satisfaction and will, no doubt, help business, we are of the opinion that the importance of the controversy has been somewhat exaggerated so far as the effects upon the iron trade are concerned.

In the first place, the entire railroad consumption of iron and steel in percentage of total consumption of iron and steel, is small relative to the proportion which once obtained. There was a time—it must have been more than two decades ago—when the railroads were estimated to consume, ultimately, 60 per cent of the total. That estimate may have been true at the time. The apparent survival of that estimate in some quarters in recent years has been due to inattention. In our issue of Jan. 30, 1908, under the heading "Railroad Facilities or Railroad Buying," we said: "An undue amount of pessimism is being indulged in because of the phospect that railroad buying will be on a reduced scale for a number of years." The state of mind of the iron and steel trade at that time will easily be recalled, and it may be observed that while since then there has not been any general loosening up in railroad buying, nevertheless in the six months Oct. 1 to April 1 last, our pig iron production was at a rate exactly 25 per cent greater than the average rate in the three years, 1905-6-7. In the editorial of Jan. 30, 1908, we showed that 1887 had marked a culmination in railroad expenditures, and suggested that 1907 would be found to represent a similar culmination, showing also that after 1887 the country was prosperous and the iron trade greatly increased its tonnage, suggesting, therefore, that similar prosperity and iron trade expansion could readily follow 1907, the general prosperity in each case being due to the existence of, rather than the process of creating, the railroad facilities. A suggestion that railroad consumption of iron and steel was much less than formerly brought a number of inquiries to this office, and in response to them a presentation was made under date of Feb. 20, 1908, showing, upon what appeared to be adequate statistical grounds, that in the two years, 1906-7, the entire railroad consumption of rolled iron and steel was about 39 per cent of the total production, the consumption of iron and steel castings 20 per cent, and the proportion of both together exactly one-third. Having regard to the fact that the consumption of iron castings (chiefly car wheels) was largely a remelting proposition, it was concluded that railroad consumption of iron and steel in 1906-7 represented one-third, in point of interest or value, of the total product of the blast furnace and rolled iron and steel industry.

That comparison referred to the experience of 1906 and 1907 when, as we held the view, since fully confirmed, the railroads reached their high point in iron and steel consumption for a period of years. The 1906 rail production was 4,000,000 tons and that of 1907, 3,600,000 tons. In 1908 and 1909 the rail production was 2,000,000 and 3,000,000 tons respectively, and the average rate is about maintained this year. The railroad consumption of other iron and steel has decreased likewise. In 1909, when we made a little more pig iron than the average of 1906-7, car and locomotive building were each about 40 per cent of the average of 1906-7.

While railroad consumption of iron and steel has decreased absolutely, and largely, since 1906-7, our total production has increased largely. In 1905-6-7, we made an average of less than 25,000,000 tons of pig iron a year, and in none of those years did production reach 26,000,000 tons, but in the twelvemonth ending with this month our production will easily pass 29,000,000 tons, while for several months last winter the rate exceeded 31,000,000 tons.

If the railroad proportion of iron and steel consumption in 1906-7 was only one-third, if it has decreased absolutely since then, and if our total production (and consumption) has increased absolutely since then, as indicated in the above comparisons, how small must the railroad proportion be now?

It must be remembered that this unwillingness—in comparison with actual needs—of the railroads to spend money is no new thing. For more than two years, they have been complaining about one thing or another and have been restricting their purchases. Their needs accumulate, and the absolute requirements must be filled sooner or later, for even bankrupt roads make purchases, and it will hardly be pretended that such a case is possible as would prevent the railroads making such purchases as are

physically required to conduct the transportation business offered them. We gave an illustration of the light buying by railroads in our issue of Mar. 31 last, showing that six systems, the Pennsylvania, Northern Pacific, Southern Pacific, Union Pacific, Rock Island and Frisco, operating 45,515 miles of road and having at the close of their last fiscal year, Dec. 31 last for the Pennsylvania and June 30 last for the others, 13,096 locomotives, had experienced a net decrease of two in the number of locomotives, although, on the whole, traffic is increasing from year to year.

In these circumstances, with the railroads lately taking less than one-fourth, perhaps less than one-fifth, of the product of the iron and steel industry, on a basis of desiring at best only to fill their absolute requirements, and with inadequate buying for nearly three years past, the iron trade has no cause for alarm in regard to the attitude of the railroads, although it may be months before the freight rate controversy shall be finally settled.

THE ABOLISHING OF SEVEN DAY WORK.

Strong words were those spoken by First Vice President Dickson, of the United States Steel Corporation, at the recent dinner of the members of the American Iron and Steel Institute, when he said:

"It is my own deliberate judgment, after a period of almost 30 years' connection with the industry, the early part of which was passed in manual labor in the mills, that the present conditions, which necessitate the employment of the same individual workman 12 hours a day for seven days a week, are a reproach to our great industry, and should not, in this enlightened age, be longer tolerated."

Mr. Dickson spoke with the deep sympathy of one who, having known from actual contact with conditions, of the terrible grinding and depressing effect of continuous labor, is anxious to improve the lot of his fellow man. The question of Sunday labor is not necessarily a religious one at all. It is a well known fact that man is not so constituted that he can work year in and year out, seven days a week for even less than 12 hours a day, and be much better than an animal. There is no time for enjoyment, no time for self improvement, no time for such intercourse with members of one's family, work means degradation. Hard as these conditions are, the difficulties of abolishing them have been many, and have been due not merely to the dilatoriness of some manufacturers, but also to positive opposition of workingmen and labor unions, who fought against reducing the hours of labor if accompanied by a corresponding reduction of pay. A single employer or number of employers could not reduce the working hours without reducing the pay, because the companies having the longer hours would be at a distinct advantage. It is not even possible for one part of the country to adopt the short hour system unless a similar policy is followed in other parts of the country. This has been clearly demonstrated in the case of San Francisco, where the adoption of the eight-hour day has proved ruinous to many industries, simply because they could not compete with other parts of the country, where the nine and ten-hour day systems prevail. If this Sunday work is to be reduced to a minimum, it is extremely desirable that the largest number of employers possible be enlisted in the movement, and, for this reason, such an organization as the American Iron and Steel Institute promises to be could have very great influence in bringing about the proposed reform. The report of the committee appointed by Chairman Gary to investigate the Sunday work question will be awaited with keen interest. It will be found impossible to abolish Sunday work entirely, especially in the case of the blast furnace, but, by increasing the number of employes, every man can be given one day off in seven, as is done by seven-day newspapers to their employes.

Samuel S. Wood has been promoted to assistant superintendent of the Howard Axle Works, Homestead, Pa., a new office, and Edward Horey has been appointed foreman of the plant to succeed Mr. Wood.

The Osborne High Pressure Joint & Valve Co., Chicago, has increased its capital stock from $150,000 to $200,000.

PITTSBURG FOUNDRYMEN ELECT OFFICERS.

At the annual meeting of the Pittsburg Foundrymen's Association at the Fort Pitt Hotel, Pittsburg, Friday evening, June 3, officers were elected for the coming year, annual reports were read and interesting addresses were delivered by out of town guests. The officers elected are as follows: President, J. S. Seaman, Seaman-Sleeth Co.; vice president, W. A. Bole; treasurer, John McLaren, the Phillip & McLaren Co.; secretary, F. H. Zimmers, Union Foundry & Machine Co.; executive committee, Joseph T. Speer, Pittsburg Valve, Foundry & Construction Co.; W. H. McFadden, Mackintosh-Hemphill Co.; O. W. Mason, Midland Steel Co.; Henry Spilker and J. S. McCormick.

The report of Treasurer McLaren showed a balance of $667.53 in the treasury, as compared with a balance of $461.34 the previous year. Secretary Zimmers reported an increase in membership from 107 to 130. Mr. Speer, the retiring president, was host at a dinner given in the Dutch room at the Fort Pitt Hotel.

Arthur T. Waterfall, president of the American Foundrymen's Association, as well as of the Detroit Foundrymen's Association, and Dr. Frank T. Stevenson, chairman of the reception committee of the Detroit Foundrymen's Association, told of plans for the Detroit convention. Dr. Richard Moldenke, secretary of the American Foundrymen's Association, gave an account of the work being done by the national association, and told of his visit to Europe, where he devoted considerable time to an investigation of the iron and steel industry.

In accordance with a resolution adopted during the early part of the evening, a telegram was sent to President Taft at Washington, D. C., urging the appointment of Dr. Joseph A. Holmes, of Pittsburg, as director of the recently created bureau of mines.

The Pittsburg delegation of foundrymen left the Union station, Pittsburg, Monday night on a special parlor-car over the Fort Wayne system of the Pennsylvania Lines West for Detroit, transferring to a boat at Cleveland.

The Buda Co., of Chicago, with works at Harvey, has increased its capital stock from $600,000 to $900,000. The increase is for the purpose of taking care of improvements recently made at the Harvey plant and to provide for the company's expanding business.

STEEL BARGES ORDERED BY THE UNITED STATES STEEL CORPORATION.

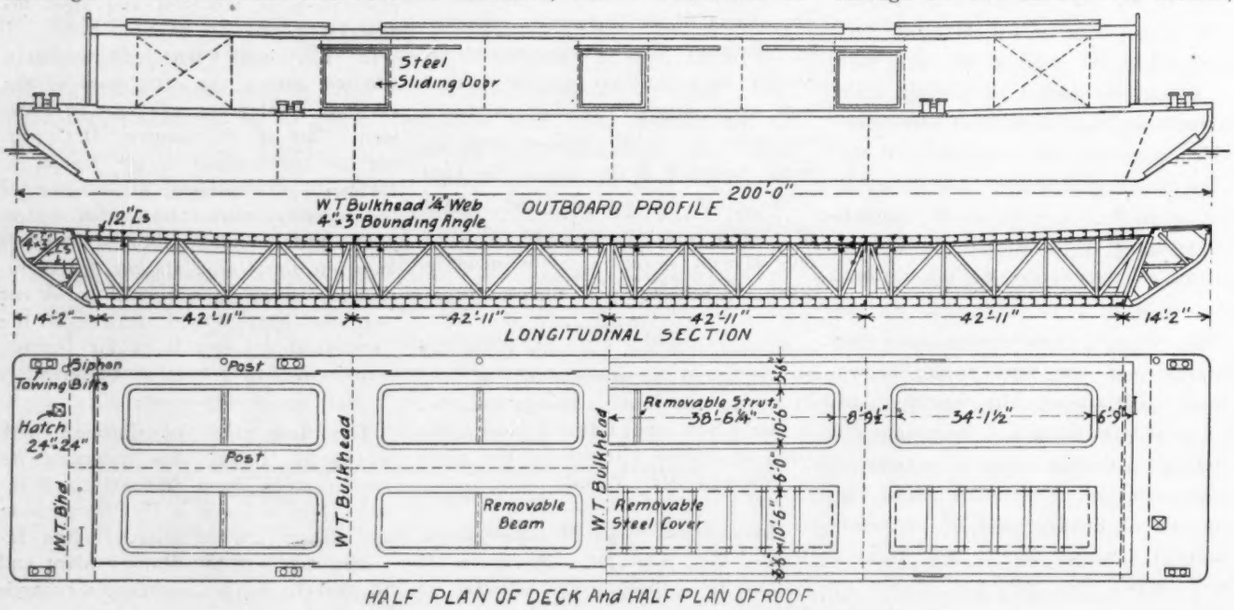
There has been considerable interest manifested lately in the improvements contemplated by the United States government to make the inland rivers, particularly the Ohio and Mississippi, navigable during a longer period each year. In order to make these rivers of general benefit to shippers the first essential is continuous service and with such service will come the craft in which available cargoes can be transported. During the past few years a great many boats and barges of steel construction have been built and these have been successfully used by shippers of many different products. With practically no exception, such craft have been designed and built at the Ambridge plant of the American Bridge Co.

Barges have been built for transporting coal, oil, sand and other bulk commodities, for service at government dams and locks, for car ferries and numerous other transportation enterprises, but to no marked degree have steel barges been used to transport steel products. It is therefore of considerable interest to note that an order has just been placed with the American Bridge Co. for ten steel barges to carry the products of the subsidiary companies of the United States Steel Corporation from the Pittsburg district mills to Cincinnati, Louisville, St. Louis, Memphis, Vicksburg, New Orleans, and other ports on the Ohio and Mississippi rivers. Arrangements have been made with the Monongahela River Consolidated Coal & Coke Co. to tow the barges. It is not unlikely that before these barges are completed the number will be increased to 25. These are not the first steel barges to be used in carrying steel, as the fleet of steel coal barges built by the American Bridge Co. for the American Steel & Wire Co., of which 30 are now in commission, has for several years been carrying coal to the mills and billets from the Shoenberger Works to Rankin and Braddock on the return trip to the coal mines.

For some time past, steel rails, cotton ties, wire nails, pipe, etc., have been carried to southern ports by the Monongahela Consolidated Coal & Coke Co. for the constituent companies of the Steel Corporation in wooden model barges and some of these are still in service. The tonnage handled in this way has been from 40,000 to 65,000 gross tons annually. The maximum tonnage of steel rails alone has, however, been as much as 150,000 gross tons in one year. The average number of round trips for a barge at present is two per year, but with improved river conditions and continuous available water this might be increased so that each barge would make at least five round trips to New Orleans annually, and a correspondingly larger number to intermediate ports. With such service, at least 250,000 gross tons of steel products could annually be distributed from the Pittsburg district to Ohio and Mississippi river ports. In fact, with improved facilities for shipment at the mills and for receiving, storing and forwarding at the important ports the volume of business cannot now be estimated, but it would not unlikely be close to one-half million gross tons.

The accompanying drawing shows the type of barge being constructed. It is 200 feet long over all, 36 feet beam, and 10 feet 6 inches deep, the deck being crowned 8 inches at the center. The sheer at bow and stern is 18 inches. After due consideration, the scow type was adopted, the rakes fore and aft being the same. The barge is of steel construction throughout with the exception of a 4-inch wood floor in the hold. Plates, angles, beams and channels such as are ordinarily rolled are used throughout, no special section being employed. Five transverse water-tight bulkheads and a longitudinal truss divide the hold into eight compartments. Openings are located in the deck centrally over each compartment and are made large enough to receive rails 33 feet in length below deck.

A cargo box covers the greater portion of the deck, and this also is built entirely of steel plates and shapes with the exception of the sides, which are of galvanized corrugated steel. Three sliding doors on each side of the barge and one at each end permit of loading and unloading of nails and other wire products, ample space having been provided for trucking the material on the deck. Provision has also been made for loading materials through the roof of the cargo box, hatches having been provided immediately over the deck openings so that rails, pipe and structural material can be lowered by a crane through both openings into the hold. Provision has also been made for loading 60-foot rails, and 70-foot structural material through the two central roof hatches,



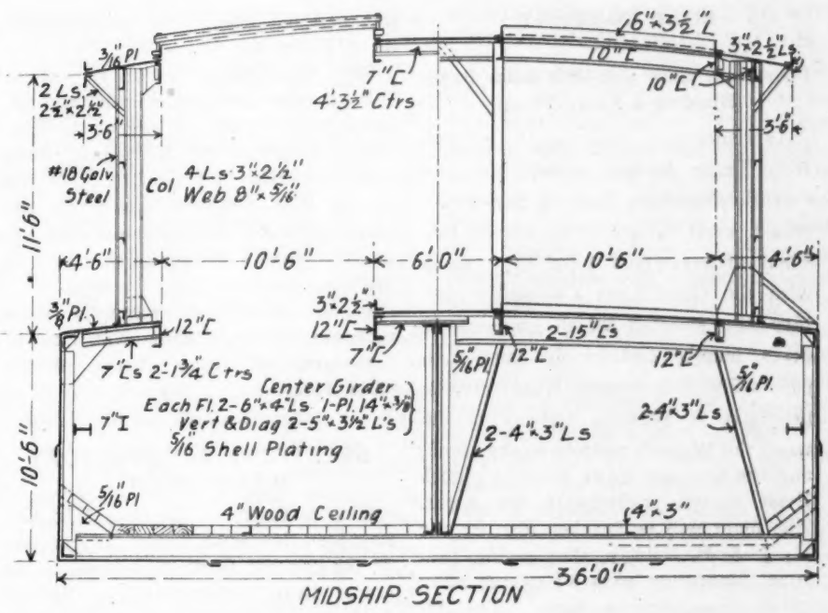
this material, however, to be carried on the deck and not in the hold. The roof hatches have steel plate covers, amply stiffened with angles and designed so as to be weather-proof. As it is customary to carry mixed cargoes, it was necessary to make barges of sufficient cubical capacity to carry the bulky and comparatively light material such as field fencing and barbed wire, and when such cargoes are carried a cargo box will be required. For rails, pipe and structural material, if not over 33 feet in length, the hold only will be needed to carry the material, but for the long lengths of structural material and rails the deck will be used, although other materials can also be carried in the hold. The draught of the barge loaded to its capacity is 9 feet, provision having been made for 18 inches free board. The barge light will draw 26 inches.

The American Bridge Co. has recently completed three barges for carrying bulk oil for service at New Orleans, ten coal barges, a wharf boat at Memphis, and two 14-car transfer barges in use at Profit island in the lower Mississippi river, conveying gravel for ballasting several hundred miles of track for the Illinois Central railroad. There are now being built four barges to be used by the United States government at Greenville, Miss., for river maintenance work and a steel floating dry dock also for the government at Vicksburg, Miss.

RAPID DEMOLITION

Of New York Skyscraper Being Done —Steel Well Preserved.

The speed with which the modern steel-frame office building may be demolished by wrecking is illustrated in the rapid progress of the demolition of several New York skyscrapers at the present time. The 20-story Gillender building on the northwest corner of Wall and Nassau streets, and the eight-story Stevens building, which have formed an "L" upon the two streets, are now being torn down to clear the site for the 31-story structure to be erected by the Bankers' Trust Co. The Volk House Wrecking Co., of 56 Beaver street, New York, has the contract for the removal of the buildings at the reported price of $50,000 to do the work in 45 days, with a penalty of $500 for every day exceeding that period. The tearing down work has now extended to the first floor and the contract has a number of days still to run. It is stated by officials of the wrecking company that this will be the most rapid building wrecking feat performed in the United States or in any other part of the world. The force of men employed numbers 250 during the day and 100 at night.



MIDSHIP SECTION

Jacob Volk, of the wrecking company, in describing the work to the New York *Times*, said:

The steel in the new building and the wrought iron in the old building were in a perfect state of preservation. We removed the steel frames by knocking off the heads of the rivets and driving them out with a drift pin.

The hardest work has been in getting down the brick backing of the stone work in front, but we managed it with pneumatic guns. The same methods were pursued with the brick work in the corners.

From the third story down will be the hardest part of the brickwork. If it cannot be managed with the air guns we shall use dynamite. It has got to go. The brick work around the wrought iron columns has also been hard to break up, but the force of the air guns succeeded in making a breach in it, so that the men could get a good hold.

We could never have tackled the job in the short time of 45 days if we had to depend on manual labor alone to tear down the two buildings. During the time we have been working so far there has not been a single serious accident, and no one has been hit in the streets by falling debris. Great care was taken with the erection of the scaffolding in both Wall and Nassau streets, so that there should be no possible chance of any accidents happening to the thousands of business men and women passing underneath every day. The work began on May 3 and must be completed on June 18, that is, of course, not including Sundays.

The Gillender building was erected in 1897 at a cost of $500,000, and it was then the tallest office building in the world. Its height with tower was 306 feet. It is stated to be the first high modern office fire-proof building that has been demolished in New York City.

FINE RECORD OF AN OPEN-HEARTH FURNACE.

The following record has been made on No. 1 open-hearth furnace of the West Penn Steel Co.'s open-hearth furnace plant constructed at Brackenridge, Pa., last fall.

The heats ranged from 80 to 90 gross tons per heat, on a total output of 290 heats, equaling 85½ gross tons per heat or a total of 28,573 net tons of ingots. The total cost of repairs during this operation was $2,550, equal to 8.9 cents per ton for repairs. The natural gas consumed by actual meter test was 5,500 cubic feet per ton of ingots produced.

During this operation and production of steel, the furnace was off only for a period of four days and is now producing steel after this short shutdown with practically the same roof and walls of the furnace proper. This plant was designed and erected by the S. R. Smythe Co., of Pittsburg.

The annual meeting of district sales managers of the Sharon Steel & Hoop Co. was held at Sharon, Pa., May 28. The business session was followed with a banquet at Carver hall.

Announcement has been made by the J. I. Case Threshing Machine Co., Racine, Wis., that it will erect a large factory on land recently purchased there.

BOLT COMPANY

Locates at Gary and Will Soon Begin Building a Large Plant.

Announcement was made in The Iron Trade Review some time ago that the Pittsburg Bolt & Screw Co. would erect a plant at Gary, Ind. Final arrangements have been made with the Gary Land Co. and a factory site selected which contains 20 acres, located east of the land company's first sub-division, lying between the Gary & Western railway to the west, the Wabash railway to the south, and the Chicago, Lake Shore & South Bend Electric railway to the north. The plant will be reached also by the E., J. & E. railway, thus giving railroad connection with all of the main trunk lines serving Gary. The interested parties propose at an early date to begin the building of a large factory for the manufacture of bolts, screws, nuts and rivets, the factory to be equipped with the most modern machinery throughout.

A company will be incorporated, under the name of the Gary Screw & Bolt Co., with officers as follows: J. R. McGinley, chairman of the board of directors; W. G. Costin, president; W. F. McKenzie, vice president; John A. Collins, general superintendent.

Mr. McGinley and his associates are men of large means, widely experienced in manufacturing enterprises of various kinds, of which the Pittsburg Bolt & Screw Co. is one of the most successful.

The demand for the company's products has grown to large proportions in the west, and this step, in locating at Gary, near the merchant bar mills of the Indiana Steel Co., from which the large requirements of raw materials will be drawn, is taken with a view of establishing a closer geographical relation between the manufacturing plant and its market.

The plant is large enough to provide for the future growth of the business, and great care has been exercised in selecting the site to obtain the best railroad facilities, both with reference to receiving raw materials and shipping the finished products. When completed and in operation, the plant will furnish employment to several hundred skilled workmen. A number of residences will be built in the eastern part of the Gary Land Co.'s first sub-division, to furnish homes for the Bolt company's employes. The latter company will begin building operations on its plant at an early date.

The Gary Land Co. is to extend Fifth avenue eastward, parallel and adjacent to the right of way of the Chicago, Lake Shore & South Bend Electric railway, through the plant site of the Bolt company, continuing the same eastward until it joins with the gravel roadway leading to the town of Millers.

W. F. McKenzie, formerly sales manager of the Upson Nut Co., of Cleveland, will have charge of the sales force.

RECEIVER'S SATISFACTORY MANAGEMENT.

Charles Bauer, of the Foos Mfg. Co., has filed his final report as receiver of the concern formerly known as the Oscar Lear Automobile Co., Springfield, O., and has turned the reorganized concern over to the Kelly Motor Truck Co., as a going and paying manufacturing company. As soon as Mr. Bauer took hold of the failing concern, Feb. 18, 1909, he obtained leave of the court to continue manufacturing, and when he relinquished his charge, he reported a balance of assets over liabilities amounting to over $52,000.

COPPER FIGURES.

Exports of copper from Atlantic ports during May amounted to 20,832 tons and the total for the five months of the year is 105,794 against 113,706 for the corresponding period in 1909. The European visible supply May 31 was 106,760 tons, a decrease of 3,450 tons since April 30. The visible supply, May 31, 1909, was 56,960 tons.

CONTROLLER COMPANY WILL BUILD NEW PLANT.

A deal was closed during the past week by which the Electric Controller & Mfg. Co., Cleveland, manufacturer of electric magnets, purchased nearly nine acres of land on Bessemer avenue, near the C. & P. tracks, on which it is planned to erect a new plant early next year.

GERMAN PIG IRON OUTPUT.

Germany's pig iron output in April was 1,202,184 tons, compared with 1,250,184 tons in April last year, and 979,866 tons in 1908. The production for four months was 4,721,000 tons, compared with 4,091,000 tons for the period last year, 4,082,000 tons in 1908, and 4,217,000 tons in 1907.

NEW RECORD

In Booking Orders Made by the Westinghouse Electric & Mfg. Co.

The Westinghouse Electric & Mfg. Co. has just concluded the largest month's business in its history by booking orders during May amounting to $4,250,000. This places the Electric company in line with the other industrial establishments comprising the "big four" of the Westinghouse interests, all of which since the beginning of the year completed record-breaking periods. The first to reach this result was the Westinghouse Air Brake Co., which in January did a business of $2,000,000, an amount considerably larger than it had ever done before. Since, the ratio of improvement has been steadily maintained and the company is busier than it has ever been. In March, the Union Switch & Signal Co. came forward with a history record-breaking record for orders booked; and it was also stated that the orders for the first quarter of the current year exceeded the amount taken during the whole of 1909. In the meantime, the Westinghouse Machine Co. secured in the month of April contracts for steam turbines, gas engines, steam engines and gas producers representing the sum of $1,200,000, which made also the record for a month's business in its history of over 30 years.

These reports establish new business records for production in all of the Westinghouse interests, and the shops in the Turtle Creek valley have never been busier.

As far as the Electric company's business for May is concerned, it is stated that these orders affected all the departments of the works. In the railway department, the orders call for electric locomotives, electric railway motors, turbo-generators and rotary converters, while in the departments for the manufacture of power transmission machinery, in the industrial power department, as well as in the production of details and supplies, the orders were all of unusual proportions.

WILL SOON BLOW IN.

It is expected that furnace "C" of the Youngstown Sheet & Tube Co., Youngstown, O., will be blown in about July 1. The William B. Pollock Co. erected the steel work on the new furnace, which was designed by Julian Kennedy, of Pittsburg.

FURNACE ACTIVITIES

Of Corporation Again on Increase—To Make Low Phosphorus.

The Carnegie Steel Co. is preparing to put one of its active Isabella blast furnaces upon the making of low phosphorus pig iron to supply the needs of this grade of the different subsidiaries of the United States Steel Corporation. In the past, the Corporation at intervals has been a buyer in the open market of low phosphorus iron for the Worcester, Mass., plant of the American Steel & Wire Co. and for other subsidiary mills. The electric steel making process now practiced at Worcester, however, has greatly reduced the requirements of this iron.

The recent improvement in the Corporation's business in finished lines is reflected in the blowing in of an additional furnace at the Carrie group of the Carnegie Steel Co. as previously reported. This action represents the completion of the curtailment policy which has been followed for a number of weeks past and which has resulted in the blowing out of a score of stacks. Production has been brought down to a point below consumption and stacks have been so diminished that an increased furnace output has now been made necessary. Another stack in the Pittsburg district will probably blow in shortly. At the present time, the complete furnace activity of the various subsidiaries is represented by 89 stacks out of a total of 119, but some of those properties included in the full list are practically of the unserviceable class.

STRIKE OF TUG EMPLOYES ENDED.

The strike of employes on tugs at Cleveland and Ashtabula has been settled and the men have returned to work under the old conditions. Officials of the unions and President Edward Smith, of the Great Lakes Towing Co., met at the offices of the company and after the conference it was announced that the demand for shorter hours was withdrawn and that the boats would be operated under the conditions of the contract made for two years last March.

HARDWARE JOBBERS ORGANIZE.

The American Iron, Steel and Heavy Hardware Association was organized May 25, at a meeting of jobbers in Chicago city. The following officers were elected for 1910: President, E. D. Kimball, Chicago; first vice president, E. P. Sanderson, Boston; second vice president, Charles E. Faeth, Kansas City, Mo.; secretary and treasurer, A. P. Plumo, New York. The object of the meeting was declared to be to protect trade interests, handle credits and improve trade conditions.

WILL CONTINUE TO SELL PANAMA SCRAP.

According to the Panama Record, the government has determined to continue the selling of Panama canal scrap in the open markets of the United States. This material has been coming into the port of New York for a number of months past, and from $11 to $13 approximately per gross ton has been realized by the government. It may now be diverted to Philadelphia or Baltimore, according to the Record, which says:

It has been determined for the present to continue the sale of the old iron and steel no longer useful in the canal work in the open market in the states. The New York office of the commission will call the attention of "scrap" men throughout the country to the opportunity to buy the material, and the ships that carry it may be diverted to Philadelphia or Baltimore to unload the iron if it is thought desirable to do so.

LARGE INCREASE OF CAPITAL STOCK.

The Hydrolic Power Co., of Niagara Falls, has taken the necessary steps to increase its capital stock from $500,000 to $12,000,000. The stockholders include Arthur Schoellkopf, George E. Schoellkopf, George W. Olmsted, George B. Mathews, Paul A. Schoellkopf, C. P. Hugo Schoellkopf and Hans S. Schmidt.

BOUGHT ZINC PROPERTY.

The property of the New Market (Tenn.) Zinc Co. has been purchased by the Grasselli Chemical Co., Cleveland, which has also leased the mining property of the Roseberry Zinc Co., at Mascot, Tenn. It is understood that the Grasselli company is planning extensive development of the properties.

ALICE STACK LIGHTED.

Alice furnace of the Youngstown Sheet & Tube Co., at Sharpsville, Pa., resumed operating, Thursday morning, after an idleness of two months for repairs. On July 1, the furnace will be turned over to the Valley Mold & Foundry Co.

The Kittanning Iron & Steel Co. on May 7 banked its Rebecca stack at Kittanning, Pa.

HARTFORD FOUNDRIES TO RUN ON OPEN SHOP PRINCIPLE.

Every brass and iron foundry in the city of Hartford, Conn., with the exception of the Hartford Foundry Corporation and the Standard Foundry Co., commenced running on the open shop principle June 1. The action followed a request from the International Molders' Union, Local 73, for an increase in pay to molders and coremakers from $3 to $3.50 per day, doing away with the special piece work schedule and a decrease in the working hours from nine to eight per day. It was taken with the support of the Employers' Association of Hartford, which recently figured in a similar light in connection with the declaration of the open shop by the builders in that city. About 300 men are employed in the foundries which have taken the action. The situation in Hartford so far as the foundrymen are concerned, is peculiar. For years local foundries have been paying higher wages than those in other cities in the state and, as a result, out of town foundries have been able to underbid city foundries on almost every class of work. On May 17, a letter making the demand for higher wages was sent to most of the managers of the foundries. Some of them declined to receive it.

The shops now running as open shops are as follows:

Iron foundries—The Pratt & Cady Co., The Pratt & Whitney Co., The Capitol Foundry Co., The Taylor & Fenn Co. and Patrick Laragy.

Brass foundries—The Whitlock Coil Pipe Co., John M. Craig, J. W. Conway, James L. Howard and E. J. Blake.

No threat to strike in case the demand was refused was made and no trouble is looked for in that direction on account of the refusal of the Hartford Foundry Co. and the Standard Foundry Co. refusing to grant the request and to run open shops.

MARYLAND STEEL CO. ACTIVITIES.

The Maryland Steel Co. now has all four of its furnaces in operation for the first time in two years. Furnace D was placed in operation about three months ago, but at that time Furnace C was shut down for repairs. The latter has just been started again. Every department of the works, including the marine branch, is now working at full capacity. A considerable enlargement of the works is now being figured out.

The Andrews & Hitchcock Iron Co. lighted its No. 2 furnace at Hubbard, O., May 25.

OPTIMISTIC VIEWS

Of Henry M. Howe, Who Writes of the World's Iron Ore Supply.

Henry M. Howe, professor of metallurgy in Columbia University, past president of the American Institute of Mining Engineers, president of the International Association for Testing Materials and otherwise distinguished in scientific matters, is the author of an article in the June *Atlantic*, which he calls "An Optimist's View of the Iron Ore Supply." Dr. Howe begins by referring to Prof. Tornbohm's estimate of the world's visible supply of ore as 10,000,000,000 tons and states that if consumption continues to increase as it has in the past, the supply would be used up in about 40 years and then adds: "Nevertheless, I believe that the cost of iron will not begin to oppress us within many hundreds, yes, thousands of years, if indeed it ever does."

Dr. Howe then expresses his dissent from Tornbohm's estimate and points out that only certain parts of Europe and relatively small parts of North America have been carefully explored, and that the rest of these continents and Asia, Africa, South America and Australia may reasonably be expected to have immense quantities of ore, while one of the richest and most abundant ores, pyrite, is not included in any estimate. These considerations, he says, increase the expected life of our iron ore supply from decades to centuries, but are less important than the incalculable quantity of material not counted as ore today which may become ore. Similarly he points out that the workable depth of ore will change as the workable richness of ore changes. Such changes, he agrees, will make iron ore more expensive, but not relatively to other minerals and many other commodities, so that he believes the increased cost will not be felt as a burden. We shall guard our iron in the future from waste and rust as we now guard copper and we shall guard copper as we now guard gold. In what he calls "an aeon-distant future," he conceives society as working, possibly, a 2½ per cent iron ore and points to the fact that a very large part of the earth's crust is a 4½ per cent ore. Going still further into speculation, Dr. Howe recalls the theory that the earth is a huge iron meteor with a thin covering of rock and suggests that human progress may reach a point where the core may be mined, giving the world enough iron to last until "mother earth, exhausted, draws together the icy curtains of her endless sleep."

Dr. Howe probably does not expect this portion of his argument to have any great effect as a bear argument in the present iron market.

Dr. Howe concludes his article by showing that the true famine ahead of the world is the coal famine, the supply being limited and its use implying its destruction.

CUSTOMS DECISIONS.

Iron Drums Duty Free.

An interesting decision, involving the construction of that portion of paragraph 151, which reads: "Cylindrical or tubular tanks or vessels, for holding gas, liquids or other materials, whether full or empty," is the following:

The board of United States general appraisers held that it was not the intent of congress to charge such drums with duty, and accordingly held they were exempt from duty, as usual coverings. As a result of the decision, the rule is that the provision does not apply to usual coverings which are incident to the importation of their contents, but to tanks and cylinders designed for purposes other than the bona fide transportation of their contents.

Floor Planing Machines Not Machine Tools.

In a lengthy decision, after reviewing encyclopedia and dictionary definitions, the board of general appraisers defined "machine tools," an expression found in paragraph 197 of present tariff act, to be "such workshop appliances as perform the work of tools." Therefore, machines used for planing floors are dutiable at 45 per cent, not being specifically enumerated in the tariff, rather than at 30 per cent as machine tools. In the opinion it was stated that if these floor planers were to be held machine tools then so were meat choppers, vegetable slicers, pencil sharpeners, stone crushers, sewing machines, looms, etc. But such is not the case.

PHOENIX CO. MEETING.

Stockholders of the Phoenix Iron Co. have been notified of a meeting called for June 28, in the Philadelphia offices of the company, when the annual election of officers and directors will be held. The stockholders will also be asked to vote upon a proposition to increase the indebtedness of the company from $930,000 to $1,500,000 for the purpose of retiring the present funded indebtedness and to enable the company to carry on and enlarge its business.

COMMITTEE NAMED

To Work Out Details of Canadian Steel Co. Merger

The merger embracing the Hamilton Steel & Iron Co., Canada Screw Co., Hamilton, Canada Nut & Bolt Co., of Toronto, with works also in Brantford and Gananoque; and the Montreal Rolling Mills, has been arranged, and a committee of four representatives of the companies concerned has been appointed to work out the details. A charter for the new company, to be known as the Canadian Steel Corporation, has been applied for with a capital of $25,000,000 and headquarters at Hamilton.

The Canadian government has appointed a royal commission on industrial training and technical education comprising the following members: Prof. James W. Robertson, Montreal, chairman; Hon. John N. Armstrong, North Sydney, N. S.; Dr. George Bryce, Winnipeg; Gaspard Deserres, Montreal; David Forsythe, Berlin, Ont.; Gilbert M. Murray, Toronto, representing the Canadian Manufacturers' Association, and James Simpson, Toronto, representing organized labor. The commission will enter upon its work in July and will tour the Dominion from the Atlantic to the Pacific coast, afterwards visiting the United States, Britain, Germany, France and perhaps other countries.

WILL BUILD RAILROAD INTO MINING COUNTRY.

The Grant Railroad Co., with headquarters at Fennimore, Wis., has filed articles of incorporation with the secretary of state at Madison. The capital stock of the company is placed at the nominal figure of $25,000. It is proposed to build a railroad into the lead and zinc mining country in southwestern Wisconsin. The line will extend from Fennimore to Bagley, a distance of 29 miles.

WAGES ADVANCED.

Employes in the shops of the Louisville & Nashville railroad, at New Decatur, Ala., have been given a daily wage increase of from 10 to 25 cents a day, it is reported. It is likely that the increase will be applied to the local shops as well. The increased earnings of the company are given as the reason for the advance.

The Oriskany Ore & Iron Co., Iron Gate, Va., has planned to blow in its Buena Vista stack the first of the week.

IMPORTING IRON

Under Difficulties at Toronto—Year's Output by Dominion Company.

Toronto, June 5.

The steamship Keystorm arrived, May 30, in Toronto harbor from Newcastle-on-Tyne, Eng., where she was built, with a cargo of 2,000 tons of pig iron from Middlesbrough, Eng., consigned to the National Iron Works, Toronto. Drawing 14 feet of water, she was unable to approach near enough to tie up at the company's wharf and had to be moored at 600 yards distance. It will probably require about ten days to unload her, in place of two. This circumstance has drawn attention to the lack of harbor accommodation for large vessels here. Manager Gordon F. Perry, of the National Iron Works, states that the company intends immediately to construct a dock of adequate size. It will be 400 feet in length, with a depth of 20 feet, and be equipped with electrical cranes and railroad tracks.

The output in tons of the Dominion Iron & Steel Co. for the fiscal year ended May 31 is as follows, in comparison with the previous year:

	1909-10.	1908-9.
Pig iron	255,932	248,097
Steel ingots	302,761	273,646
Blooms	269,810	246,323
Rails	147,948	133,064
Rods	81,001	50,554

Construction work on the extension is being steadily carried on. The concrete foundations of the 250-ton openhearth furnaces, and the substructure of the new blast furnace are completed. Half the battery of 120 new coke ovens are finished and the whole will probably be in operation in August. All departments are working to full capacity. A triplex process will be used in connection with the new 500-ton steel furnaces.

The Grand Trunk railway, in addition to heavy orders given ten days previously, placed orders yesterday for nearly $2,000,000 worth of rolling stock, including 15 Richmond compound consolidated freight engines, 25 mogul locomotives, 1,000 hopper bottom steel coal cars of 100,000 pounds capacity, 1,500 underframe box cars of 60,000 pounds capacity, and 500 steel underframe box cars of 60,000 pounds capacity. The car orders went to the Canada Car & Foundry Co., Montreal; the Silliker Car Co., of Halifax, N. S., and the company's own shop at Point St. Charles.

WORKING SATISFACTORILY.

The Southern Iron & Steel Co. has placed its Alabama City, Ala., steel and wire mills in operation, and they are now turning out finished product in the shape of nails, woven wire fence, barbed wire, etc. The mills are working satisfactorily, having started off operating smoothly.

MORE PAY WANTED.

Cincinnati, June 4.

The Pattern Makers' League of North America has sent the following letter to the jobbing pattern shops:

"The Pattern Makers' Association, of Cincinnati and vicinity, has discussed the proposition of an increase in wages and a 50-hour week in all jobbing shops throughout the jurisdiction of this association, to secure a 15 per cent increase and a 50-hour week, with the least possible inconvenience to the employer and employe, and to this end we ask the co-operation of the employer in order that the present harmonious relations between the jobbers and men may continue to exist. We would request that you favor us with a conference."

The pattern makers are now receiving a minimum of 42 cents per hour, with a maximum of 48 cents in jobbing shops, which rate is above the average of that paid in many other cities for the same work. Inasmuch as there are no contracts with the union, a demand of 15 per cent increase in wage and 11 per cent decrease in time, or a total of 26 per cent extra expense to the employer, appears so unreasonable that the whole affair borders upon the ridiculous.

TREATMENT OF METALS DISCUSSED.

The Pacific Northwest Foreman's Association, of Seattle, at a meeting held May 21, was addressed by Jas. Mayer, of the firm of Jas. Mayer & Sons, wholesale manufacturing jewelers, Colman building, Seattle, on "Treatment of Gold, Silver, Tin and Lead." The aim of this association is to bring the members of the metal trade industries together for mutual instruction, and the discussion of current topics of the trade. Though but recently organized the membership is already large and growing rapidly. George James, of the Variety Iron Works, Seattle, is president, and A. H. Garrison, of the United Metal Trades Association, district of Washington, is secretary.

An amendment to its articles of incorporation has been filed by the Holbrook-Armstrong Iron Co., of Racine, Wis., increasing its capital stock from $50,000 to $150,000.

IN DOUBT

Are Future Developments in Alabama Consolidated Matters.

Baltimore, June 6.

Telegrams have just been received here by the directors of the Alabama Consolidated Coal & Iron Co., from James H. Hoadley, its president, of New York, informing them that their resignations as directors had been received with regret. He also informed the Baltimore interests that his new associates would be in Baltimore shortly, and that he hoped that all interests could be harmonized. What will transpire at the next meeting is uncertain. The interests in Birmingham who have been stirred to the point of talk of attempts at receivership proceedings will probably be appeased also. Whether or not the Baltimoreans will remain is problematical, like the rest of the situation, in the face of the recent sale of control to Pennsylvania interests.

GOOD MACHINERY SALES.

The sales office in New York of the Covington Machine Co., Covington, Va., reports a very satisfactory business, and amongst others the following sales recently made by the company: Six heavy punches and shears, weighing about 110 tons, to the Detroit Bridge & Steel Works, in Detroit, where an order was also received from the Northern Engineering Works; one No. E double punch and shear, weighing about 80,000 pounds, to the Chesapeake & Ohio R. R. Co., for the Huntington, Ind., shops; two machines to the Baldwin Locomotive Works, in Philadelphia; a heavy-duty double punch and shear to the York Safe & Lock Co., York, Pa.; a special multiple punch and angle shear to the E. Van Noorden Co., Boston; and ten punches and shears to different shops in New York, Buffalo and Pittsburg, as well as for export.

FOREIGN RAIL TRADE.

The week has been almost a blank so far as rail business is concerned, the only order of any size actually placed being one for 2,160 tons of 60's for the Burma railways, which has gone to the Barrow Hematite Co. With the exception of an inquiry from the Northern of Canada railway for 6,000 tons, the fresh business in view has been negligible.—The Ironmonger, London.

IN THE MACHINERY FIELD

NEW YORK.

Action Against Railroads Affects Market—Cranes Out For Gary.

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., June 7.

The absorbing topic of discussion in the machinery field the past week has been the probable disturbances to arise from the government's action against the railroads in the raising of freight rates and its effect in holding up purchases by the different systems. This question has an especial application to the machinery market at this time when there are outstanding inquiries from the railroads for probably $300,000 worth of machine tools and other equipment. In this territory, the New York Central list involving upwards of $150,000 worth of tools has been pending for a number of weeks and, though prices have been taken, practically no awards have been made against it. It is feared that the developments at Washington, which will undoubtedly have considerable effect upon railroad credits, may result in the New York Central list being held up indefinitely. The Delaware, Lackawanna & Western list for the Scranton, Pa., shops, which aggregates about $75,000, and has been before the trade for several weeks, seems more likely to be closed in the next several weeks, as the matter is now in the hands of the purchasing committee.

Prior to the appearance of this new factor in the situation, there was more evidence of some falling off in the general volume of machine tool business placed, yet here and there were some signs of improvement. The local New York district demand has been better and some nice orders have been placed. An improved tone to the market is reported from Pittsburg, where of late there has been some slowing up of business, and some houses report having booked so far in June several orders which aggregate a larger total than the entire month of May. The automobile trade is scaling down, but Detroit sellers state good prospects are before them for June buying.

In cranes, the market is most interested just at present in the inquiries for such equipment being put out by the American Sheet & Tin Plate Co. for its new plant at Gary, Ind. A score of machines ranging from five to 100 tons capacity each, are to be purchased, and the order will probably amount to about $50,000. The figures for the cranes are being taken in Pittsburg. Some other steel companies are placing crane orders, and a number of smaller inquiries are pending, but the demand does not seem to be as strong as it has been. In industrial locomotives, there is more business in sight and the outlook seems better.

The Ingersoll-Rand Co. in the week placed additional orders in New York and Philadelphia for machine tools for replacement needs at several of its plants. The company has been buying in the market for several weeks for the Phillipsburg, N. J., Easton and Athens, Pa., shops. A number of milling machines were included in the purchases made at Philadelphia.

The Pennsylvania railroad closed for a few additional tools for the Altoona shops in the week. The eastern branch of this system has been buying in this way for some time, but as reported the lines west are out with a large list which is to be disposed of in the western selling centers.

The De La Vergne Machine Co., East 138th street, New York, reports that it is meeting with much success in the adoption of its new types of oil engines and has made a number of installations in metal fabricating shops. The company has recently furnished one engine each of the "FH" type of the 170 horsepower to the Snead & Co. Iron Works of New Jersey, to the Hedden Iron Construction Co., of Newark, N. J., and to the Richmond Forgings Corporation, of Richmond, Va. All these engines are direct connected to the generators and furnish the power distributed by electric transmission to the various machines in the shop.

The commissioner of health of the state of Pennsylvania will receive proposals until June 22 at his office, 1900 Race street, Philadelphia, for the erection and completion of a central heating plant at the Pennsylvania State South Mountain Sanatorium, near Mont Alto, Franklin county, Pa.

Plans have been filed with the building department of the city of New York for the erection of a four-story brick boiler house, on Forty-ninth street, near Lexington avenue, for the New York Central & Hudson River Co. The building will be 95 by 126 feet in dimensions, and it is estimated will cost $150,000.

The bureau of supplies and accounts, navy department, Washington, will receive bids, June 14, for pneumatic machines and tools, hardware, machinery steel and other supplies for the Brooklyn navy yard.

A large quantity of machinery of various types was disposed of to separate purchasers in the sale of the plant of the Empire State Engineering Co., at Rome, N. Y., May 26. In all, 506 lots of machines were disposed of and the favorable prices realized for the equipment reflect the active demand and delayed deliveries that now prevail on some lines of machine tools and other machinery.

The Bradley-Gaffney-Steers Contracting Co., New York, has announced that it is preparing to bid for the construction of the new Broadway-Lexington, the Broadway-Lafayette and the Canal street subways, which are soon to be inaugurated by the metropolis at a cost of $80,000,000 to $100,000,000. The public service commission has prepared two forms of contract for the construction of the work, one for the building by private capital and another for construction with municipal capital. The city is now making the necessary financial arrangements which will give it a borrowing capacity of more than $125,000,000. It is expected that advertising for bids for the new subway system will begin about June 15, and that the bids will be opened the beginning of August. Machinery sellers and builders are looking to this construction to provide the requirement of an enormous amount of all kinds of equipment.

The Alliance Machine Co., Alliance, O., has sold, through its New York office, 42 Broadway, two 20-ton and one 10-ton electric traveling cranes to the Bethlehem Steel Co., South Bethlehem, Pa., for installation in the foundry department of that plant. A number of inquiries for cranes are now pending in the market.

The Garvin Machine Co., Spring and Varick streets, New York City, has under contract with private parties the building of five automobiles of a new type. Among the features which radically differ from the average pleasure car is a one-cylinder engine, which is expected to develop a very high horsepower.

The Hammond Iron Works, 29 Broadway, New York, constructor of heavy plate work, reports itself well supplied with orders, and is now advertising for 150 skilled workmen.

The P. H. & F. M. Roots Co., 120 Liberty street, manufacturer of blowers, pumps and gas exhausts, reports that it has so many orders on hand that its plant at Connersville, Ind., is running day and night.

PITTSBURG.

Business Quiet But Plants Running Full Time—Railroads Holding Up Their Lists for the Present.

Office of THE IRON TRADE REVIEW,
510 Park Building, June 7.

A comparatively small portion of the new work, which includes the installation of practically all kinds of machinery and on which estimates were completed recently is being placed, and the past week has been rather a quiet one in machinery circles. A large amount of estimating is being done, but there is no assurance that awards will be made, except on a small part of this work for some months.

There is no indication that the railroads will come into the market for machinery, tools and shop equipment. The motive power department of many of the lines has been instructed that, except in cases of absolute necessity, all orders are to be held up for the present at least, until the attitude of the government toward the railroads becomes more favorable, and until after Congress adjourns.

Notwithstanding the fact that the market is quiet, most of the local makers have considerable business on

hand, and unless cancellations are made will experience no difficulty in operating their plants full time for the next six or seven months.

A number of the plants are now in a position to offer reasonably prompt deliveries on new orders, whereas a month ago they were unable to promise delivery until late in the fall.

The Mesta Machine Co. is running its plant at West Homestead, Pa., day and night, and has many large orders on its books.

It is now generally believed that the awards for machinery and equipment for the plate, jobbing and sheet mills to be built at Gary, Ind., will not have much effect upon the outside market as it is believed that most of this equipment will be furnished by the Steel Corporation's subsidiary companies. Two or three weeks ago bids which had been submitted by independents were rejected, and since then the original plans have been revised.

It is authoritively stated that some fairly good awards for sheet and tin plate mill equipment will come up in the near future. Details of this work have not yet been announced, but it is said that part of the equipment will go to Eastern Ohio and the remainder to an independent plant in the immediate Pittsburg district.

It is also announced that the merging of independent coke companies will result in contracts being awarded for a large number of additional coke ovens, and the installation of new machinery at several of the big plants in the Connellsville region. However, it is not likely that a very large amount of this work will develop until the latter part of the year.

Louis Sukernek, Buffalo, N. Y., Andrew Brady, George A. Walker, Charles H. Howard, and A. H. Forbes of Emporium, Pa., have organized the Mt. Hope Coal & Coke Co., with a capitalization of $50,000, and it is understood that they will enter the market shortly for machinery for a modern mine.

The Standard Steel Car Co., is understood to be figuring on extensive improvements in the way of additional machinery equipment at the Butler, Pa. plant. It is expected that bids will be invited shortly.

Work has been started by Roberts & Co. on the new boiler shop at Queen Junction, along the Bessemer & Lake Erie railroad, plans for which were announced recently.

The Buffalo, Rochester & Pittsburg Railway Co. is said to be estimating on new machinery for its various repair plants and is reported to be contemplating the extension of its lines from Mt. Jewett to Kane, Pa.

Pittsburg machinery makers expect to bid on the machinery and shop equipment for the Western Maryland extension, which will be 83 miles long and on which work has been started. A contract has been awarded to A. DeMayo & Co., Ashtabula, O., to build from Slippery Rock, Butler county, Pa., to Grove City, nine miles, and contracts are to be awarded next week for building 20 miles additional between Slippery Rock and Butler. No contracts have been awarded as yet for power equipment.

The Bessemer Gas Engine Co., Pittsburg, has received several fairly large orders recently, which include two 300-horsepower gas engines to be shipped to Clarksburg, W. Va.; 300-horsepower gas engine to be installed in the municipal water works at Cincinnati; one 110-horsepower engine for the Vulcan Crucible Steel Co., Aliquippa, Pa.; 150-horsepower direct gas engine driven compressor and a 135-horsepower twin cylinder Bessemer gas engine for the Tiwah Mining Co., Galena, Kas., and 110-horsepower engine for the A. C. Williams Co., Ravenna, O.

The J. and J. B. Milholland Co., Pittsburg, has received a contract for a new building and part of the equipment for a sand plant to be built at Bristol, Tenn., for the Reynolds White Sand Co.

The West Overton Distillery Co. has awarded a contract to the Bollinger-Andrews Co., Pittsburg, for the erection of a new five story brick and steel bottling plant at Scottdale, Pa.

Two 1,200-horsepower direct gas engine compressors to be used in pumping gas by the Ohio Fuel Supply Co. are being built by the Snow Steam Pump Co., Pittsburg.

An order has been placed by the Jones & Laughlin Steel Co., Pittsburg, with the Otis Elevator Co. for an equipment of full automatic steam skip hoist engines which will be installed at the Soho furnaces next month.

The Pennsylvania Rubber Co., Jeannette, Pa., which has increased its capital to $2,000,000, will erect additional buildings and install modern machinery to meet the demands of its rapidly increasing trade in automobile tires and mechanical goods.

By a deal just closed the Petroleum Iron Works, Sharon, Pa., has been practically reorganized. A. W. Krause, Charles A. Lytle, E. G. Wright and H. L. Stafford, of Pittsburg, disposed of their holdings to Joseph P. Sweeney, as trustee for the majority of the stockholders. Mr. Sweeney will assume charge of the company next month, and it is expected that extensive improvements will be made.

The new steel castings plant of the Union Spring & Mfg. Co., Pittsburg, at New Kensington, Pa., has been placed in operation. The main building, of steel construction, 100 x 160 feet, is equipped with a cupola, two converters, the necessary core ovens, annealing ovens and equipment for cleaning castings, also pneumatic hammers and sand blast. The plant has a capacity of 25 tons of castings a day and is operated by electric power, all machines being driven by individual motors.

John Francis, warden of the Western Penitentiary of Pennsylvania, Pittsburg, is accepting bids for the construction of a steel storage reservoir of 150,000 to 175,000 gallons capacity. Samuel E. Duff, 206 Empire building, Pittsburg, is the engineer. Plans and specifications may be obtained from him.

MILWAUKEE.

June Should be Good Month in Milwaukee—Buildings Planned Will Need Considerable Machinery.

June 7.

Announcement has recently been made by two of Milwaukee's large manufacturing concerns that they will erect new buildings during the summer. The National Brake & Electric Co. will build a one story reinforced concrete and brick addition, 118 by 193 feet, to its plant at Belleview and Larkin place at a cost of $50,000. The Stroh Die Molded Casting Co. will put up a seven story fireproof factory building costing $125,000 on land purchased at the corner of Michigan and Jackson streets. According to present plans both of these structures will be ready for occupancy by fall.

The Simmons Mfg. Co., of Kenosha, Wis., manufacturer of brass and iron beds, has notified the Kenosha Electric Railway Co. that after Nov. 15 it will not furnish that company with electric current and surplus steam as it has been doing. No statement has been made by the officers of the street railway company as to their plans for the future, but it is expected that a large power house will be erected by the railway company in the near future.

The American Seating Co., of Racine, Wis., has commenced the erection of a large boiler house and new dry kilns. Plans for a new office building are also being made but it has not been decided when this building will be erected.

An effort is being made by E. T. Melms, Social Democratic president of the Milwaukee city council, to have an ordinance passed prohibiting the operation of steam boilers by other than duly licensed persons. His measure provides that no one shall operate a stationary boiler with over fifteen pounds of pressure to the square inch unless he is 21 years of age and has secured a license from the city costing $3. Licenses are renewable yearly for $1. Applicants are to be examined before an examing board appointed by the mayor, and should a license be received, or an attempt made to obtain one, through improper means the person shall be debarred from receiving any license in the future. Heavy fines are to be provided for owners of boilers or those who operate them without a license.

The new engine and pump recently purchased by the Fond du Lac, Wis., Water Co. from the Bates Machine Co., of Joliet, Ill.; has been installed in the company's plant.

The Manitowoc Aluminum Foundry Co., of Manitowoc, Wis., has been sold to the Aluminum Casting Co., an Ohio corporation. Conrad Werra, president of the Wisconsin company, has been placed in charge of the plant by the new owners. The plant was organized ten years ago.

The Beaver Dam Foundry Co., of Beaver Dam, Wis., has purchased a

five acre site on the Chicago, Milwaukee & St. Paul tracks and will erect a modern reinforced concrete foundry building 70 by 200 feet.

Building operations have been commenced by the Fargo Creamery Supply Co., of Lake Mills, Wis., on its new plant. Six reinforced concrete buildings are now being erected and will give a total floor space of 658,050 square feet.

Plans for a new fireproof pattern warehouse, 160 by 200 feet, to be erected this summer have been completed by the Wisconsin Engine Co., of Corliss, Wis.

The Gardner Machine Co., of Beloit, Wis., advises that it will let the contract for its new plant in South Beloit, by June 10, and that immediately thereafter, work will begin on its erection. The building will be 100 by 200 feet, the first 40 feet being two stories, providing for the office on the second floor. The building will be of the monitor roof style, except the two-story portion mentioned, and will be of reinforced concrete construction.

The Allis-Chalmers Co., of Milwaukee, Wis., has placed a new lighting transformer on the market, and is finding a ready sale for it. Six points are claimed for this transformer over all others. They are, its safety, or freedom from danger to the consumer; its ability to withstand hard usage both in handling and in service; its efficiency, especially its all day efficiency; its light weight and small size; the ease with which it is regulated and its own close regulation; and last but not least its small cost, the first cost as well as the cost of upkeep.

Among the orders recently received by the Allis-Chalmers Co. are: The Fayette Electric Light & Power Co., of Fayette, Mo., one 16 x 30 simple belted Reliance type Corliss engine, one 150 K. V. A. alternator, and one 120-volt belted exciter; The Flatbush Gas Co., of Brooklyn, N. Y., one 2,500 K. V. A., 2-phase turbo generator.

The Milwaukee Concrete Mixer & Machinery Co., Milwaukee, has recently sold Milwaukee mixers to the following firms: Harmon Construction Co., Peoria, Ill., Thos. Carey & Sons, Clinton, O., A. E. & W., Evansville, Ind., Mr. Roseberry is very well satisfied with the business he has done with this new mixer.

The National Gauge & Register Co., of Minneapolis, Minn., manufacturers of automobile accessories and supplies, will open a branch factory at La Crosse, Wis.

Capitalists from the northern part of the state recently paid a visit to Jefferson, Wis., with the intention of securing a site upon which to erect a large machine shop.

The Racine Boat Co. is planning to erect a new factory building and new launching ways. The factory will be 60 by 140 feet and will be equipped throughout with new machinery. A new warehouse will also be erected in the near future.

The Gisholt Machine Co., Madison, Wis., is to spend in the neighborhood of $350,000 in improvements and additions to its plant. Work will be started immediately.

The Rundell-Spence Mfg. Co., manufacturer of steamfitters' and plumbers' supplies, will erect a new factory in the near future on ground just purchased.

Worden & Allen Co. has been awarded contracts for the erection of a plant to be operated by a new company for the manufacture of steel tubing. The plant with machinery will cost in the neighborhood of $300,000, and will employ between 700 and 800 men. F. W. Renshaw, Chicago, is president, and Geo. J. Thust, formerly with the Detroit Steel Co., superintendent.

CLEVELAND.

Inquiries Show Decrease in Cleveland. —Volume of Business Closed is Small.

Office of THE IRON TRADE REVIEW, Penton Bldg., Chestnut and E. 12th, June 7.

Business on the whole was quiet in Cleveland during the past week. Several of the machine tool dealers complained of a falling off in business placed and also in inquiries. In the opinion of many of them, however, this was attributable to the short week, owing to the holiday, and bad weather, which kept many out of town buyers from coming to the city. An optimistic feeling prevails and the consensus of opinion is that the depression is only temporary.

A deal was closed during the past week by which the Electric Controller & Mfg. Co., manufacturer of electric magnets, purchased nearly nine acres of land on Bessemer avenue near the C. & P. tracks, on which it is planned to erect a new plant early next year.

Frank C. Osborn, president of the Osborn Engineering Co., will deliver an address on Wednesday, June 15, at the commencement exercises at Rensalaer Polytechnic Institute.

The Halcomb Steel Co. reports business during the past week as very good, although the automobile manufacturers are still holding up specifications. It regards prospects as being bright and anticipates a considerable increase in business as soon as the automobile manufacturers get ready to place their orders.

The W. H. Welch Machinery Co. has found business improved during the past week and, in the opinion of Mr. Welch, there is more business around now than there has been for some time. Inquiries come from a variety of trades and a general class of buyers.

The W. M. Pattison Supply Co. reported business as quiet, with inquiries fewer in number. In the opinion of Mr. Hess, the bad weather and the holiday had something to do with the lack of orders.

The C. O. Bartlett & Snow Co., manufacturers of elevating and conveying machinery, reports the following recent sales:

Verna Brick Co., Duluth, Triumph dryers and conveyors; capacity 42,000 brick a day.

Central Mfg. Co., Lockland, O., four compartment direct heat dryer for drying fertilizer.

Grasselli Chemical Co., three sets of heavy crushing rolls, together with elevating and conveying machinery.

Jacobs Asbestos Mining Co., Thetford Mines, P. Q., Canada, one Special Common Sense pan conveyor 250 feet centers. Capacity 150 tons of asbestos rock an hour.

Indiana Steel Co., Chicago, two dolomite elevators.

American Reduction Co., Pittsburg, condensers for new fertilizer plant at Westmoreland, Pa.

National Carbon Co., Cleveland, elevating and conveying machinery.

Washington Fertilizer Co., Washington, special garbage disposal machinery.

Pennsylvania Salt Co., Philadelphia, elevating and conveying machinery.

Flint Power Syndicate, Jackson, Mich., coal and ash handling machinery.

Owens West Virginia Bottle Co., Fairmont, W. Va., one car haul and hoist.

Caxton Building, Cleveland, one elevator for handling ashes.

Electric Bond & Share Co., New York, N. Y., Triumph coal crushers.

Diamond Rubber Co., Akron, O., two drop forge chain conveyors and conveying tire core, 120 feet centers.

Gould Paper Co., Lyons Falls, N. Y., coal handling machinery.

New York Sanitary Utilization Co., New York, N. Y., garbage disposal machinery.

It is receiving a number of orders for paint machinery as well as for crushers and shellers. It is also receiving some business from South America.

The K-W Ignition Co., Whitney Power Block, is going to build a new plant this summer.

The board of county commissioners will receive bids until 11 a. m., June 25, for the erection of a number of concrete bridges. Frank R. Landry is county surveyor.

The Ohio Pressed Steel Co., of Bucyrus, O., which was recently incorporated, is looking for a site on which to erect a plant. As soon as this is secured, it is anticipated that bids will be asked for the equipment.

BUFFALO.

June Opens Dull in Buffalo—Demand Falls Off Considerably.

Office of THE IRON TRADE REVIEW, 932 Ellicott Square, June 7.

The past week has been extremely dull in all classes of machinery, and those in touch with the trade look for less business during the next couple of months. This is due to the usual summer lull, which has been intensified during the last two weeks, although the early part of May was exceptionally good. There has been practically no demand for the larger tools, and even inquiries in this line are scarce. Inquiries are still coming in for electric equipment, but a large part of this business is from out of town. There is some activity in woodworking machinery but not much. Many of the plants are installing machinery ordered months ago, and a few will increase their equipment. The feeling is that although prospects for the summer months do not indicate an unusual volume of business, the outlook for the fall trade is decidedly good.

The Cliff Paper Co., Niagara Falls, is contemplating improvements costing in the neighborhood of $25.000. An additional story is to be added to

the building containing the beater department and shipper room, and concrete floors will be installed throughout the building. The work will be begun this month.

The Hydraulic Power Co., Niagara Falls, has increased its capital stock from $500,000 to $12,000,000. Among the stockholders are Arthur Schoellkopf, Jacob E. Schoellkopf, George W. Olmsted, George B. Mathews, Paul A. Schoellkopf and Hans S. Schmidt.

Much interest has been aroused by the incorporation of the Rochester Belt Line Railroad Co., of Rochester, to operate a standard gage railroad around that city. The railroad will be 15 miles long, and the papers of incorporation give the company the right to use either electric or steam power. The new company has a capital of $2,500,000. Among the directors are, Thomas A. Dudley, Niagara Falls; Henry C. Brewster and John F. Alder, Rochester; and William A. Holden, Syracuse.

The purpose of the belt line will be to connect all the railroads entering the city, thus affording easy means for the transfer of freight. The plans of the company include yards and storage tracks and warehouses sufficient to meet the needs of the business to be handled. It is generally understood that electrical power from Niagara Falls will be used.

The National Fireproofing Co., of Pittsburg, has been looking for a Canadian site, and it is understood the company has decided to build a $1,000,000 plant at Hamilton, Ont., from which all the Canadian business will be handled.

G. W. Kittridge, chief engineer, New York Central & Hudson River Railroad, Grand Central station, New York, is accepting bids for two additions to the Ohio street freight house and the reconstruction of the old docks and the construction of new ones, also the construction of an office and storage building, on Ohio street, Buffalo, N. Y. The buildings are to be 140 x 300 feet, one story; 196 x 300 feet, one story, and 24 x 64 feet, two stories. The work will call for structural steel, steel piling, reinforcing steel, skylights, etc.

Col. W. L. Fisk, U. S. Engineers, Buffalo, N. Y., will receive bids until 11 a. m., June 27, for the erection of steel lock gates, valves, and operating machinery for the ship lock in Black Rock Harbor, Buffalo, N. Y.

Plans are being drawn for a new factory, dry kilns, etc., for the Watson Wagon Co., Canastota, N. Y.

The Prentiss Tool & Supply Co., 115 Liberty street, New York, has established a Rochester office at 315 E. & D. building, which is in charge of L. S. Jones.

The Fillmore Avenue Foundry & Iron Works is having plans prepared for additions to its plant at Fillmore avenue and the Pennsylvania railroad. The plant will be of concrete, brick and steel construction. Martin C. Schwab, 161 State street, Chicago, is engineer and will have dimensions and details ready for publication in the near future.

BOSTON.

Big Plants to be Built at New Bedford —Developments Planned Should Help Business.

June 7.

One of the largest developments of a prospective contract for textile machinery in this section in months was realized this week by the announcement of the incorporation of the Sharp Mfg. Co., of New Bedford, with a capital of $1,500,000, the greater proportion of which has already been subscribed for in Boston. Plans for a five story mill have been drawn and ground is to be broken in about three weeks in hopes of having it ready for the installation of 80,000 spindles in November or December.

New Bedford also has practically been selected as the locating point of a new 500-loom mill for the manufacture of fine cotton goods by Thomas Nelson, of the firm of James Nelson, of Nelson, Eng. Mr. Nelson has spent much time here lately, and says that later the concern will build spinning and dyeing plants.

Frost, Briggs & Chamberlain, of Worcester, are drawing plans for a four-story, 140 by 60 feet, addition to the plant of the Union Twist Drill Co., of Athol, Mass. It is also planned to build a new side track to the plant. The new plant and improvements, including new machinery, will cost, it is estimated by President MacGregor, $50,000.

The new five-story mill now in process of construction by the Massachusetts Mills, of Lowell, Mass., will call for electric motors throughout, two elevators of a capacity of two tons each and complete equipment of shaftings, weaving machinery, etc. These contracts, it is understood, are unlet and are in charge of the engineers, Lockwood, Greene & Co., of Boston. The plant will be of modern mill construction, 375 by 85 feet.

Contracts for building a bleach house, 32 by 30 feet, a cutting shop, 25 by 30 feet, and a stock house, 72 by 80 feet, for the National Fiber Board Co., of Bar Harbor, Me., is held by the Fiske-Carter Construction Co., 11 Foster street, Worcester, Mass. The amount to be expended is about $35,000.

The Tremont & Suffolk mills, of Lowell, Mass., are to erect additions to mills Nos. 1 and 2. They will each be 21 by 20 feet.

The Cahill Electric Music Machinery Co. plans to build a new plant in Holyoke, Mass. The concern is now located in the Crocker-McElwain mill, in Cabot street. Thaddeus Cahill is head of the concern. New machinery will be installed throughout.

The Boston Machine Co. has sold to Elam P. Small the factory building and land in Roxbury, for $6,300.

The machinery of the Leicester Card Clothing Co., of Leicester, Mass., will be sold, and the firm will go out of business within the ensuing two weeks or so.

The H. H. Brown Co. has been incorporated under Massachusetts laws to manufacture boots and shoes at North Brookfield, Mass. The capitalization is $450,000.

The Fort Stanwix Canning Co., of Rome, N. Y., will build a new corn canning plant at Hampden, Me.

The Parks Paper Co., recently organized, has purchased the properties of the Dalton Paper Co., of Fitzdale, Vt., something a little less than $1,000,000 being involved in the deal. The mill, which has not been in operation for the past year, will be entirely reequipped to double its capacity. The sale includes a pulp mill with seven grinders, and a one-machine paper mill. The officers of the new company are: President, Lee A. Parks, of Glens Falls, N. Y.; treasurer, John F. King, of Millinocket, Me.; clerk, H. B. Howe, of St. Johnsbury, Vt.; and manager, U. M. Waite, of Millinocket, Me.

The contract for the erection of an addition to the plant of the Homer D. Bronson Co., of Beacon Falls, manufacturer of sheet bronze and brass goods, has been awarded to the Tracy Bros. Co., of New Britain, Conn.

The Standard Electric Time Co., Waterbury, Conn., is moving its manufacturing department to Foxboro, Mass., into the plant of the Standard Gage Manufacturing Co. The sales office will remain in Waterbury, Conn.

The Dunbar Brothers, of Bristol, Conn., are building an addition to their factory which is expected to increase their capacity 50 per cent. Part of this addition is to take care of the increased demand for vanadium steel springs for automobiles and motor cycles.

The New Britain Machine Co., New Britain, Conn., which has recently made an addition to its plant, has just broken ground for another addition, which will be about 60 x 130 feet, five stories. These additions will about double the capacity.

CINCINNATI.

Small Orders Form Bulk of Business —Automobile Companies Buying Steadily.

Office of THE IRON TRADE REVIEW,
Room 11, Blymyer Bldg., June 7.

The month of May, taken as a whole, is said to have been fairly satisfactory to tool manufacturers, and compares very favorably in volume of business with any previous month of the year. No large lists of any special size are now pending, but the bulk of the trade is made up of a number of small orders, comprising machinery for various interests, embracing both standard and special designs. In standard tools, the demand continues strongly in favor of milling machines and lathes, with the heavier designs of planers gradually showing an increased activity. The automobile interests continue to be the ruling factor in the drill and grinder trade and manufacturers of these tools are several months behind in deliveries. The local jobbing foundries are said to be only fairly busy, new work not being pressing at this time.

A complete exhibition of gas and

gasoline accessories will be one of the features of the semi-annual meeting of the National Gas and Gasoline Engine Trades Association, to be held at the Sinton hotel, June 13-16. The address of welcome will be made by Mayor Schwab, and will be responded to by C. O. Hamilton, of Elyria, O., vice president of the association.

The stationary engineers will hold a state convention at Hamilton, O., June 15-18. Arrangements are being made for 500 guests, and an interesting time is expected. The meeting will convene in Jacobs hall, and be opened by an address of welcome by Mayor Rothwell, to which President F. E. Brammer, of Ironton, O., will respond.

The Great Miami Development Co. recently organized, electing Morgan Wamsley president and J. C. Miller secretary. The company now has a nominal capitalization of $5,000, which will shortly be increased to $1,000,000. The company proposes to secure the necessary power from the Big Miami river, at Cleves, O., and to furnish cheap power to manufacturers in that locality. The engineer, with his corps of assistants, has about completed the preliminary surveys, and is now working on estimates and blue prints. Computations show that at this point, 11,000 horsepower can be developed at a cost not exceeding $70 per horsepower, including necessary auxiliary plants. All rights have been secured and the necessary funds for the erection and installation of the plant have been assured. Owing to the natural topography of the surroundings, more horsepower can be obtained at this point, with only one dam, than in any other section of the middle west. Work on the construction is expected to commence about Aug. 1 of this year.

The Cincinnati Industrial Bureau is endeavoring to secure the general headquarters of the Brotherhood of Locomotive Firemen and Enginemen, now located at Peoria, Ill., and a large publishing plant at Indianapolis. Several other cities have entered the contest, and it is expected a selection will be made by the convention, which meets at St. Paul, next Monday.

The Huenefeld Co., of Cincinnati, with a capital stock of $1.000 000, was granted a charter at Columbus this week. The incorporators are E. H. Charles and W. E. Huenefeld, C. T. Pfau and C. F. Pietman Jr. The new corporation will take over the assets and business of the E. H. Huenefeld Co., which is a $350,000 corporation, located at Spring Grove avenue and Straight street. The company manufactures and deals in stoves, ranges, roofing and metal house furnishings.

The Stewart Jail Works Co. and the Stewart Iron Works Co. have been merged into a $1,000,000 concern, to be known as the Stewart Iron Works Co., with offices at Covington, Ky.

The Victor Safe & Lock Co., whose entire plant is to be removed to much larger quarters at Norwood, O., has about finished the excavating and grading for its main plant. Additional plans are being made for a cabinet building that will add another building to the group, and the work of erection will commence and be pushed forward as rapidly as possible.

The Hisey-Wolf Machine Co., Colerain and Marshall avenues, Cincinnati, has started work on the erection of a new plant.

The R. K. LeBlond Machine Tool Co. will shortly receive bids for two additions to its Linwood plant, Cincinnati.

The Cincinnati Roofing Tile & Terra Cotta Co., and the Jacob Freund Roofing Co., whose plants were recently destroyed by fire, will both build considerably increased plants immediately.

The recently incorporated Mead Engine Co., of Dayton, O., will shortly decide upon a site upon which to erect a plant in the near future. It will manufacture an auto engine designed by Cyrus E. Mead.

The W. F. Robertson Steel & Iron Co. has taken over the plant of the Union Sheet & Tin Plate Co., at Marietta, O., and will start three of the mills in the near future. It will make a specialty of tin plates.

The Cincinnati Planer Co., having completed its removal into new buildings, at Oakley, has found it necessary, owing to its greatly increased capacity, to make several changes and promotions in its organization, and in the future the company will be officered as follows: C. H. M. Atkins, president; B. B. Quillen, secretary and treasurer; Geo. D. Walker, assistant secretary and treasurer; Geo. Langen, works manager; Frank Gebhart, superintendent; Percival Reston, chief draftsman; Charles Meiers, sales engineer.

WASHINGTON.

Isthmian Canal Commission Lists Again a Feature — Important South American Tour of Department of Manufactures Agent.

Office of THE IRON TRADE REVIEW.
Post Building, June 7.

The Isthmian Canal Commission has made public several lists calling for machinery and mechanical equipment, a part of which comes under the regular construction appropriation. The supervising architect of the Treasury Department is calling for bids on the erection of several U. S. post-offices, also for the lighting fixtures for U. S. buildings in eight cities, and is also calling for a quantity of metal vault shelving. An important announcement is made by the Bureau of Manufactures of a tour by an official of that department through South America. Altogether the bids called for from Washington should be of considerable interest to machinery and supply houses.

First Lieut. Frank H. Phipps Jr., constructing quartermaster, Fort Adams, R. I., will receive bids in triplicate until 10 a. m., June 14, for furnishing material and labor required for the lowering of the boiler room floor and relocating the boilers and boiler connections in barrack building No. 22 at Fort Adams, R. I. Plans may be had on deposit of $2.

Maj. Thos. H. Slavens, constructing quartermaster, military prison, Ft. Leavenworth, Kas., will receive bids in triplicate up to 10:30 a. m., June 30 for furnishing 1,600 brass cocks, 795 non-siphoning basin traps and 10,000 feet wrought iron pipe with fittings. Blue prnts may be had on deposit of $5.

Maj. M. Gray Zalinski, depot quartermaster, army building, New York City, will receive bids until 2 p. m., June 20, for furnishing and delivering at factory or F. A. S. steamer, New York or San Francisco, ice and refrigeration plant for Corregidor island, P. I.

Capt. F. C. Boggs, general purchasing officer, Isthmian Canal Commission, Washington, D. C., will receive bids until 10:30 a. m., June 20, for the following supplies under circular 587: Manganese shells for revolving screen for rock crushing plant, steel castings, firebox steel, crucibles and hose couplings.

He will also receive bids until June 21 under Canal Circular 588 for furnishing the following miscellaneous material: 4,000 lengths of air brake hose, 900 feet of rubber belting, 300 pounds asbestos sheet millboard packing, 1,000 pounds asbestos sheet packing, 1,500 pounds rubber sheet packing, 300 pounds corset lacing, 1,450 asbestos manhole gaskets, and 12,750 asbestos hand hold gaskets, 500 corrugated copper ring gaskets, 10 rail benders, 6 galvanized kedge anchors, saws, diaphram pumps, water gages, flue cleaners, and other miscellaneous supplies. Until 10:30 a. m., June 23, he will receive bids for steel castings and repair parts for steam shovels under Canal Circular 586.

The Isthmian Canal Commission will soon issue a circular calling for bids on the following material and supplies: 2,875 air hose couplings for four-ply hose, 715 air hose couplings for armored air hose, one locomotive crane of 20-ton capacity for 3-inch gage, fifteen 180-tooth bevelled gears to be of cast steel, thirty 14-tooth pinions to be of cast steel, fifteen hawsers, 60 pressed steel half-ring bolts for liners for centrifugal pumps.

The Paymaster General, Navy Department, Washington, D. C., will receive bids until June 21 for the following supplies: 20 bilge pumps, steel bars and rivet rods, 78.400 pounds sheet copper, 1,500 pounds composition spikes, 3,510 pounds hexagonal nuts, 7,510 pounds cast iron washers, 50,000 pounds manganese bronze for castings.

Bids will be received by James Knox Taylor, supervising architect, treasury department, until 3 p. m., July 5, for the construction complete of the post office at Troy, Ala.

The same architect will also receive bids until 3 p. m., July 12, for the construction (including plumbing, gas piping, heating apparatus and electric conduits) of the attendants' quarters, United States marine hospital, at San Francisco, Cal.

He will also receive bids until 3 p.

m., June 24, for furnishing and installing lighting fixtures in the U. S. buildings at Chippewa Falls, Wis., Danville, Ky., Winchester, Va., Jackson, Miss., London, Ky., Montgomery, Ala., Gulfport, Miss., and the New Orleans Mint.

He will also receive bids until 3 p. m., July 7, for the construction complete (including plumbing, gas piping, heating apparatus, electric conduits and wiring), of the United States postoffice at Beloit, Wis.

Bids will also be received until 3 p. m., July 14, for metal vault shelving for the United States custom house, San Francisco, Cal. Copies of the specifications may be obtained at his office or at the office of the architects, Eames & Young, Wright Building, St. Louis, Mo.

He will also receive bids until 3 p. m., June 21, for metal shelving for the office of the supervising architect, treasury department, Washington, D. C. Specifications may be had at the above office.

He will also receive bids until 3 p. m., June 28, for the construction complete, including plumbing, gas piping, heating apparatus, electric conduits and wiring, for the United States postoffice at Plattsmouth, Neb., and until 3 p. m., June 27, for the construction including plumbing for the United States postoffice at Minneapolis, Minn. Until 3 p. m., June 30, he will receive bids for the construction complete including plumbing, gas piping, heating apparatus, electric conduits and wiring, for the United States postoffice at Greenville, Ill. Until 3 p. m., June 24, he will receive bids for the construction complete including plumbing, gas piping, heating apparatus, electric conduits and wiring, for the United States postoffice at Aiken, S. C., and until 3 p. m., June 27, for the construction complete, including plumbing, gas piping, heating apparatus, electric conduits and wiring, for the United States postoffice at Clinton, Mo.

Announcement is made by the bureau of manufactures of a tour by an official of that department that is expected to be of service to American exporters of metals and other products. The bureau says:

"Special Agent John M. Turner, who is about to make an extended tour through South America in furtherance of the export trade of the United States, invites letters of suggestion and inquiry from American manufacturers. He will assist in establishing local connections for those desiring agencies through which to sell their goods, and will undertake trade investigations along practical lines indicated by business firms who will address the bureau of manufactures."

DETROIT.

General Machinery Business Quiet—New Automobile Plants and Additions Reported.

June 7.

Business in machine tools this week has been light. The orders being placed are mostly for odd tools, and are coming from all over the territory. The dealers look for a let up in trade at this season of the year, as most of the automobile companies are finishing up their 1910 cars, and will not be ready with the 1911 production until the latter part of July or the first of August. The unseasonable weather has had the effect of holding up, to a certain extent, the sale of automobiles, so that some of the dealers have been making some concessions in price to move their stock. This has given the industry a little uneasiness. If weather conditions should settle in the next week, it would not take long for the automobile dealers to move their stock, and perhaps stimulate placing orders for 1911.

There have been rumors here for some time of the establishment of a steel plant near Detroit. This week a number of steel manufacturers have been looking the ground over, and the daily press has made the statement that the plant is assured. This has not been verified, however, although a local plant might find a market right at hand for its product.

It is the report in the automobile circles that the United States Motor Co. has purchased the stock of the Stoddard-Dayton Co., of Dayton, O., manufacturer of the Stoddard and Courier automobiles. This company will add 9,500 cars to the output of the United States Motor Co.

The Burroughs Adding Machine Co. has let contract for reinforced concrete addition to its plant. The building will stand at right angles to the main building and will be 241 feet long, 65 feet wide, four stories, making extra floor space of 78,325 square feet.

The capital stock of the Gear Grinding Machine Co. has been increased to $300.000. This increase is to take care of the new plant which will be ready early in August.

The Hall Lamp Co. is just about to let a contract for a new building at the corner of Hancock and Rivard streets.

A number of the Detroit automobile companies are establishing plants across the river in Windsor, or Walkerville, to escape the high duty levied on American-made cars. The latest addition to that colony is The Regal Motor Co. It is planning a building 300 feet by 60 feet, and an output of ten cars per day. The land has been purchased from the city and contracts will be let at once.

The Clayton & Lambert Mfg. Co. has let contracts for an addition to its building at Trombley avenue and Beaubien streets.

The Morton Baking Co. is building another building in Plum street, 75 feet by 100 feet, two stories.

Dodge Brothers, manufacturers of auto parts, purchased some time ago a large tract of land in the north part of the city, and will erect a new plant on it to cost in the neighborhood of $750.000. Plans are now being drawn by their engineering department.

The Aluminum Casting Co. is planning a new plant in Hamtramck, a section lying just north of the city and served by the Grand Trunk railway, which will double its capacity.

The Hupp-Johnson Forge Co. is locating a plant on Bellevue avenue. Machinery is being purchased this week.

The Michigan Smelting & Refining Co. is planning to erect a group of buildings south of The American Radiator Co. Three buildings, 60 by 300 feet, will be erected at once, with others for storage, etc. Joseph Stillman is the general manager.

The Stuart Motor Car Co. is the latest addition to Detroit's motor manufacturers. It has taken over the Co-operative Foundry & Machine Co., at Junction avenue and the Wabash railroad. William M. Walker is president.

NEW ORLEANS.

Saw Mill Equipment Sales Feature of the Week—General Machinery Business is Quiet.

June 6.

As a compensation for the dullness of the machinery trade in sugar factory equipment, rice irrigation and drainage departments, the lumber trade came to the forefront last week in a conspicuous manner, and several large orders were placed. Locomotives for saw mill tap lines were the leaders, and in every instance an Ohio company from Lima was the fortunate bidder. The largest locomotive sold was a 70-ton Lima geared for heavy grade work. This was shipped to the Eastman-Gardner Lumber Co., whose plant is at Laurel, Miss.. Many other southern firms, especially those east of the Mississippi river are, or soon will be, in the market for locomotives, as all are trying to get in line for the divisions in rates which it is said are to be allowed them by the Interstate Commerce Commission in its decision on the tap line question.

Another matter of business interest to the saw mill machinery trade is the competitive bidding for the equipment of the Alger-Sullivan mill at Century, Fla. This mill was destroyed by fire some weeks ago, and the company is receiving bids for its reconstruction. The loss was $1,000,000. Among the machinery needed are 2 double cut band saws with edgers and trimmers and the necessary apparatus for their locomotion. Amongst those bidding are the Allis-Chalmers Co. which had the old mill order; McDonough, of Eau Claire, Wis.; Filer & Stohl, of Milwaukee; Clark Bros., of Milwaukee. The Atkins Saw Co. furnished the saws for the old mill through its New Orleans agency, and it is making a strenuous effort to retain the business.

The Chalmette Cypress Co., a company recently organized here, is in the market for equipment for its mill. It needs two single cut 15-inch band. The Great Southern Lumber Co., of Bogalusa, which lost its planing mill by fire some days ago, is one of the most liberal buyers in the local market and will rebuild at once. Most

of its orders are placed but the announcements have not been made.

In the sugar machinery line, about the only company which is keeping busy is that of Bancroft, Ross & Sinclair. Its latest orders are from the firm of Sully Martel & Co., of St. Mary parish for the Himalaya Planting Co. These consist of a heavy crusher with the requisite hydraulics. The order amounts to about $15,000. John H. Murphy, of the Murphy Foundry Co., of this city, is supplying the rollers, boilers and their accessories. His contract will be upwards of $40,000.

In the drainage machinery line the newest development is the formation of a company known as the New Orleans Drainage Co., for the reclammation of 34,057 acres of land about 12 miles from this city. It will install a couple of 500-horsepower electric plants and pumping stations. The company has about $500,000 immediately available for the purchase of dredges, drainage plows and the accompanying equipment. Within a year the promoters will drain an area of 5,000 acres and build an automobile road 13½ miles long from the excavations. The property will be converted into small farms.

TORONTO.

Machinery Makers Busy and Outlook is Promising—Many New Plants to be Built or Under Construction.

June 6.

There is little change to note in trade conditions. Machinery manufacturers have orders in hand to keep them steadily busy for some time, and a continuance of activity throughout the season appears assured. The demand for agricultural machinery and gasoline engines is unprecedented, owing to the rate at which immigration is pouring into the west, and deliveries in these lines are considerably delayed, the plants finding it impossible to overtake orders. In other departments the pressure is not so great. The great activity in building is causing a heavy demand for structural steel, hardware and construction material. While money is readily obtainable for ordinary business requirements, the banks have latterly adopted a more conservative attitude as regards expansion and the undertaking of new lines of production, and are not disposed to make advances for these objects. It is probable that some of the extension planned by manufacturers earlier in the season may be abandoned or postponed on this account.

Henry Disston & Sons, Ltd., Toronto, have secured a contract for supplying saws for the new plant of the Nepisiguit Lumber Co., Bathurst, N. B., for about $3,500.

The Miller Co., Ltd., brass manufacturer, capitalized at $70,000, has located at London, Ont., and will start operations in about two weeks under the management of William Miller, late of Hamilton, Ont.

G. S. Sinclair & Sons, of Wiarton, Ont., manufacturers of lumbermen's machinery, have erected a large addition to their factory and will considerably increase their plant and undertake the production of new lines of goods.

Next week the Dominion Bridge Co. will proceed with the erection of the steel framework for the new five-story Union Bank building, on the corner of King and Bay streets, Toronto. A strenuous endeavor will be made to beat the record in the time of the work.

Horace J. Clark, owner of manufacturing rights in the Clark "all steel" portable gold and harbor dredge, is in Toronto, looking for a Canadian location and seeking to interest local capitalists.

The citizens of Renfrew, Ont., have voted $117,000 to purchase water privileges and develop electric power to the extent of 1,000 horsepower on the Bonnechere river.

The Ontario Brass & Copper Co., Toronto, assigned for the benefit of creditors on May 30. The liabilities are placed at $20,000, with assets nominally the same.

The United Textile Corporation, Jos. F. Mack, president, is looking for a site for a factory on which it is reported it is to spend upwards of $1,000,000.

The Dominion Felts, Ltd., has started to erect a factory at Elmira, Ont.

The Morrisburg Tack Mfg. Co., Morrisburg, Ont., is reported to be about to erect a factory for the manufacture of nails.

The North America Smelting Co. is reported as negotiating for a site at Kingston, Ont., on which to erect a plant, estimated to cost $75,000.

The Grown Electrical Co., of St. Charles, Ill., manufacturer of electrical supplies and gas fittings, will commence work on a new factory at Brantford, Ont., in the near future.

The Eastern Canada Steel & Iron Works, Ltd., will shortly erect a plant at Quebec, P. Q., for the manufacture of structural steel for building bridges, etc. The company has secured a tract of land at St. Malo on the line of the C. P. railroad.

The Quaker Oats Co., of Chicago, is negotiating for a location at Calgary, Alberta, on which it will erect a $500,000 plant.

Contracts have been signed between the town of Owen Sound and a group of English capitalists which insure the construction of a $1,000,000 ship building and repair plant and two drydocks at Owen Sound. The plant will be built on the C. P. railroad water front, and will include two drydocks, two graving docks 650 feet long, and a floating drydock capable of handling steamers up to 300 feet in length. The yard plans will include building berths for three vessels, complete machine shops, boiler shops and the usual equipment of a thoroughly up-to-date ship building plant.

The Canadian Pacific Railway Co. is planning to replace many of its wooden snow sheds through the Rocky Mountains with steel structures. Plans for these new sheds have been prepared by the chief engineer.

Geo. White & Sons, London, Ont., manufacturers of threshing machines, are spending $100,000 on a new plant.

The Watt Machinery Co., of Ridgetown, Ont., will remove to London, Ont., where a new factory is now being erected for it.

A new 6,000,000-gallon turbine pump to cost $30,000 is included among the items in the $375,000 bill for water extension in the city of Montreal, Can.

SEATTLE.

Considerable Construction Work is Planned in Seattle.—Outlook Promising for Summer Business.

Office of THE IRON TRADE REVIEW, 942 Henry Bldg., June 7.

When several plants in this neighborhood now planned or under construction are finished, several good lists of machine tools should be put out. Several power plants are projected and the city of Seattle has appropriated $33,000 to be used for the completion of the municipal shops. The improvements at Spokane by the Great Northern Railroad should call for a large amount of equipment and the $150,000 power plant and cement plant to be erected by the Atlas & Etna Cement Co. will also bring out good lists.

The Kenton Sheet Metal Works, of Portland, Ore., is having plans prepared for a $20,000 building on Brandon street.

The Great Northern Railway intends to make extensive improvements at Spokane, Wash., including some new shops.

It is reported that the Aetna and Atlas Cement companies will establish a power plant and cement factory on the Salmon river, near Boise, Idaho, at an expenditure of $150,000.

Plans are being prepared for a 30-inch submerged pipe line under the Willamette river, Portland, Ore., and for new reservoirs to be built on the west side.

The Alaska Perseverance Gold Mining Co. and the Northwest Power Co., of Juneau, Alaska, will erect a 100-stamp mill on their property in Silver Bow basin.

The Columbia Construction Co., 231 Sherlock building, Portland, will erect a $20,000 freight dock at foot of East Water street.

The Griffin Wheel Co., of South Tacoma, Wash., will erect four buildings, costing $125,000, at once, including a cable house, a charging plant 60 x 100 of reinforced concrete and brick, and a concrete and brick foundry 75 x 300. Plans are on file at the office of the Griffin Wheel Co.

Bids will soon be asked for the construction of the proposed $80,000 depot for the British Columbia Railway at New Westminster, B. C.

The British Columbia Electric Railway is to build large repair shops at the south end of the Westminster bridge in New Westminster, B. C.

O. B. Preston, president of the Municipal Lighting plant of St. Johns,

Mich., will establish a power plant at Sheridan, Mont.

Plans for a large paint manufacturing plant are under way for the Kingsley Chemical Reduction Co., of Spokane, Wash. The plant is to be built two miles west of Coeur d'Alene, Idaho, at a cost of about $150,000. There will be six buildings of concrete and steel and the machinery that will be used will be brought from Germany. The company was incorporated last fall and G. E. Kingsley, Edward Evans, John C. Garwin, Albert Allen and George W. McKee are among the Spokane men interested.

The city of Seattle has appropriated $33,000 to be used in the completion of the municipal shops and stables now under construction by the city. Comptroller Bothwell has been authorized to sell $955,000 of refunding bonds.

Wright & Smith, machinists, King street dock, Railroad avenue, South Seattle, have been awarded the contract for the installation of eight winches on the United States army transport "Dix."

Construction has been begun by Schwager & Nettleton, of West Railroad avenue, Seattle, Wash., of a saw mill to be operated entirely by electricity. The mill will be located on a bulk head and the tide flat will be dredged out to accommodate the largest ships at the mill dock.

KANSAS CITY.

Machinery Market Disappointing—Inquiries Few and No Sales Worthy of Mention.

June 6.

Granting an enormous amount of business in general being transacted over the entire southwest, the greater bulk of which is confined to speculation, monied interests and banks refuse short time loans except to established interests. Money will be in still greater demand during the month of July with an increased rate of interest demanded. The manufacturing and jobbing interests so closely related to and depending to a great extent on these conditions, continue to report very inactive markets. Collections are, however, very fair. Machinery interests both in new and old equipment note very disappointing business with few inquiries from the surrounding territory and no sales worthy of mention in this city. Considerable new construction within the city limits is being done by the Metropolitan Street Railway Co.

T. J. Strickler has purchased the entire business and fabricating plant of the John L. Bartlett Structural Steel Co., of this city. The firm name will be changed to The Federal Structural Steel Co., which company will occupy the old offices in the Heist building.

Marion Parks, M. Strickler and Robert Lemon, all of Kansas City, with offices in the Scarritt building, have recently formed the Empire Construction Co., of Kansas City, which company will build the Oklahoma City & Southwestern railroad between Oklahoma city and El Paso, Texas. The company has been working more than a year under a Texas charter and has 170 miles of the proposed 526 miles of roadbed under grade and ready for rails.

The Kansas City Structural Steel Co. has been awarded the contract for erection of 200 tons of Bethlehem sections, which will constitute the steel frame for the new six story Webster Withers building.

Delivery of freight by electric power to all the wholesale houses in the northern part of the city is planned by the Kansas City Viaduct & Terminal Railway Co. Tracks will be laid through the principal wholesale section. Laterals will be run from these tracks to the individual shipping platforms. Electric locomotives, similar to the ones in use in the east, will be used to handle the cars. Four of these motors have been ordered.

MISCELLANEOUS.

The Hills Co., Amherst, Mass., is to improve its engine room and increase its power.

The Dubuque Packing Co. is erecting a new plant, which it is estimated will cost in the neighborhood of $60,000.

P. Morey & Son, printers, Greenfield, Mass., will erect a new building and install an engine and power plant in the near future.

Additional engines and dynamos are to be installed in the city power house at Cullinan, Ala.

J. H. Matthews, county clerk of the board of county supervisors, will receive bids for the construction of a reinforced concrete and brick jail at Martinsville, Va.

W. A. Fullgraf, engineer of the city light, power and water plant, Cameron, Mo., is in the market for separator, trap and pressure valves.

An engine and two boilers will be installed in the modern laundry, which is to be built at the New Jersey state hospital for the insane at Trenton, N. J.

Plans are being drawn for the erection of a new brewery for the Wm. Rahr Sons Co., Manitowoc, Wis., which is to cost several hundred thousand dollars.

The Helming-McKenzie Shoe Co., of North Cincinnati, O., is receiving estimates for a new power plant in which will be installed two engines and three boilers.

H. Teasdale, president of the water commission, Sparta, Wis., is desirous of obtaining figures for the installation of a new pumping plant with a capacity of 1,500,000 gallons daily.

A plant including cold-storage building, light and power plant is to be erected by the Alabama Canning Co., of Bayou La Batre, Ala. A company was recently capitalized at $180,000.

The St. Louis, Iron Mountain & Southern Railway is reported to be considering removing its division headquarters from Cotter, Ark., to Crane, Mo.

The Houston Belt & Terminal Railway, F. L. La Pierre, resident engineer, Houston, Tex., is contemplating a number of improvements at Houston, amongst others the erection of a $200,000 drawbridge over the ship channel about a mile above the turning basin.

The Board of Supervisors of Stanton, Mich., will receive bids until 1 p. m., June 22, for the necessary labor and material for the construction and completion of a county courthouse and jail including sheriff's residence at Stanton.

Sessil & Rhodes, Box 308, Bulawayo, South Africa, want to correspond with manufacturers of machinery and supplies, including mining equipment and material, contractors' supplies, leather, fire appliances and various machinery with a view of representation in South Africa.

Two and a half miles of six-inch cast iron water mains have been ordered laid by the City of St. Paul, Minn.

The Toledo Machine & Tool Co., Toledo, O., reports a season of unusual activity. It has just shipped three carloads of trimming presses to a drop forging plant in Chicago; a mammoth punch press to an electrical concern in central New York, and two carloads of presses to a manufacturer in Michigan. Next week, it will ship a carload of punch presses to Berlin, Germany.

ORE IN NEW MINE COMES TO SURFACE.

Exploratory work by the Breitung interests in the Randville iron mining district in Michigan has uncovered a large body of silicious ore which is well up in iron for ore of that description, and low in phosphorus. In some places, and over considerable areas, the ore comes up to the grass roots and can be handled with steam shovels, while drilling has shown that it reaches to great depth. It was expected earlier in the season that the company would open the mine and ship from it this year, and this may still be done though the unexpected dullness of the iron ore season has rendered it uncertain. The company owns 160 acres in the district, all of which can be reached by a short extension of the line now serving the Groveland mine.

FIRE IN ORE MINE.

Fire which started in the Laura mine near Hibbing, May 30, and did considerable damage is now reported as extinguished. The property is owned by the Winifred Iron Co., and is operated in connection with the Inland Steel Co. A considerable amount of timber in the mine was destroyed, but no serious caving resulted.

IMPORTANT OPTION

On Iron and Timber Lands Taken by the United States Steel Corporation.

By a deal closed in Duluth, June 1, the United States Steel Corporation has taken the final step in a transaction which is expected to result in a very large addition to its land holdings in the Lake Superior iron region. It has acquired an option on the vast acreage of the Michigan Iron & Land Co. in the upper peninsula of Michigan. Upwards of 400,000 acres are concerned in the transaction. The bulk of the lands are timbered, and at least one-half of the area lies in the Marquette range iron-bearing formation. It is said that no similar deal of equal importance to upper Michigan has ever been put through.

Of the holdings of the Michigan Iron & Land Co., more than 300,000 acres are owned in fee simple. The remainder of the area amounts to approximately 120,000 acres. The surface of this 120,000 acres has been disposed of in past years, chiefly to lumber interests, which have removed the timber, but the company still retains the mineral rights. The option taken by the Steel Corporation is in two parts. One provides for the purchase of all the standing timber, amounting to many millions of feet, and the other provides for the acquirement of such mineral lands as the Steel Corporation chooses to take.

The purchase of the timber is contingent upon the verification of the Michigan Iron & Land Co.'s figures of the amount of the wooded resources. These estimates have been revised annually and are said to be conservative. The Steel Corporation will at once put a large force of experienced woodsmen on the lands covered by the deal, and the work of determining the values they carry in timber will be prosecuted with all expedition. It is said that it will require a year to complete this task. The option is so drawn as to give the prospective purchaser all the time required for this purpose. The consideration in the event that the deal is closed is of large proportions.

Agrees to Explore.

Such lands as are in the iron-bearing belt, these including both those owned in fee and those in which only the mineral rights still are held, the Steel Corporation agrees to explore in thorough manner. Five years are allowed for this work, and the operations will be pushed with the greatest vigor. Exploratory work conducted on adjacent lands has already determined that considerable of the Michigan Iron & Land Co.'s acreage possesses mineral value, and there is hardly a question that the Steel Corporation will find merchantable ore. For all the ore mined a stated royalty will be paid. Such lands as are found to contain no deposits of mineral may revert to the Michigan Iron & Land Co., but in any event the Steel Corporation agrees to purchase all the timber, providing the estimates in that particular receive verification. Of that verification there is practically no doubt.

Great Possibilities.

The lands of the Michigan Iron & Land Co. extend westerly from Marquette, Mich., for a distance of 100 miles. They comprise every alternate section in that territory, and for miles north and south of it. Practically all the pine has been removed, but very large quantities of other timber remain. From a mineral standpoint there is hardly a limit to the possibilities of the 200,000 or more acres which lie in the Huronian formation. Throughout the history of the corporation the management of the Michigan Iron & Land Co. has been conservative. It has conducted no exploratory work itself, and only a few tracts included in the immense holdings have been tested by prospectors, to whom options have been granted. Only one mine has yet been opened, that one a property operated by the Cleveland Cliffs Iron Co., and no deep drilling has been done.

As the Michigan Iron & Land Co. holds alternate sections over the immense tract referred to, its acreage approaches at many points lands whose mineral value has been definitely proved within the past year or two, during which period it has granted no exploring options. It has desirable tracts in the North Lake country, now being energetically tested with important results, and it has lands surrounding promising properties in other localities. It has one particularly valuable piece of land, isolated from the main body of its holdings, in Iron county, Mich., an option on which has been eagerly sought by many interests. Frederick H. Begole, a Marquette capitalist, has held an option on all of the Michigan Iron & Land Co.'s holdings the past 18 months, and it is through him that the Steel Corporation has now acquired its interest in the properties.

American Directors.

While the Michigan Iron & Land Co. is an English corporation, its directorate is American. John M. Longyear, formerly of Marquette, Mich., now a resident of Brookline, Mass., is the president. The lands were originally a portion of the big grant made to the state of Michigan by the federal government in 1857 to encourage the construction of railroads. They were deeded to the Marquette, Houghton & Ontonagon Railway Co. as a bonus for building a line from Marquette westerly to a point on Keweenaw bay, and subsequently, some 35 years ago, they passed into the hands of the present company. The Michigan Iron & Land Co. stockholders have been receiving dividends realized from the sale of pine, and now that the Steel Corporation undoubtedly will find and develop a number of mines, they apparently are assured of a permanent source of revenue. The timber, if it is taken over, will be purchased outright by the Steel Corporation and will be held in reserve for use as needed.

STEEL FOUNDRIES QUARTER.

The American Steel Foundries has issued its report for the quarter ended April 30, 1910, which shows as follows:

	1910.	1909.	1908.
Net earnings	$536,510	$238,282	*$114,767
Other income	11,200	4,516	33,148
Total income	$547,710	$242,798	*$ 81,610
Int. sinking fund, depreciation, renewals, etc.	†229,874	153,998	140,075
Net income	$317,836	$ 88,800	*$221,694

*Deficit. †Includes interest on borrowed money, $29,294; interest on debentures, $103,104; interest on bonds, $133,015; sinking fund, $41,210; bond sinking fund installments and profits, $79,865, and depreciation of meltings, plants, etc., $251,248.

The earnings for the nine months ended April 30, 1910, follow: Net earnings, $1,239,304; other income, $32,312; total income, $1,271,616; net income after interest, depreciation, etc., $633,880.

BIG STOCK DIVIDEND.

A meeting of the stockholders of the Singer Mfg. Co. to be held in Elizabeth, N. J., has been called for June 16, to authorize an increase in the capital stock of the company from $30,000,000 to $60,000,000. From this increase, a stock dividend of $30,000,000 will be declared.

The Roane Iron Co. blew out its No. 2 Rockwood, Tenn., stack on May 2 for repairs.

THE MICROSCOPE AND SOME OF ITS APPLICATIONS TO METALLURGY[1]

The Importance of Study of the Structure of Various Materials.

By Wirt Tassin.[2]

All metals are made up of aggregates of crystalline grains—and this holds true for an alloy as well as for a virgin metal—regardless of their origin or to what processes they may have been subjected, whether they were deposited from solutions or smelted, and then cast, rolled, forged or drawn, hot-worked or cold-worked. These aggregates constitute the structure of the metal, and its character is determined to a large extent by the heat and mechanical treatment to which the metal has been subjected; a certain structure is also characteristic of certain physical properties. Such being the case, it becomes apparent that some means of identifying structures and determining the conditions under which a given structure could be reproduced, would result in the manufacture of a metallic product of the greatest efficiency. It is at this point that the usefulness of the microscope and its industrial value becomes apparent since with its aid we can determine the character of the desired structure and exercise a control over the treatment which will yield it.

Preparation of the Surface.

In order to study a metal under the microscope, it is first necessary to polish it to a mirror finish. If this be carefully done, it is possible to develop a structure by this means alone, as is shown by Fig. 1 (see insert), which shows the segregated lines of oxide in a piece of ingot copper polished in relief. The preparation of a surface polished highly enough to show structure in relief is tedious and time-consuming, and the results obtained are more or less unsatisfactory so that it is generally more expedient to stop the polishing when a good finish has been obtained and then etch the surface with some solvent. This, if properly carried out, will develop the structure with great distinctness, as is illustrated by Fig. 2, of a section of copper similar to that just shown, but etched with ammonium persulphate.

The preparation of a polished surface may be accomplished in various ways, but I will limit myself to a description of my own methods. The specimen, which may be of any desired size, and I have prepared sections as large as a cross-section of an ingot of copper, as shown in Fig. 3, is first cross-filed and then draw-filed, and when hand smooth, is finished on a power polishing machine. This machine is motor-driven and is so geared that the heads travel at about 2,000 revolutions per minute. The construction of the machine is very simple and, exclusive of the motor, it can be made in any shop at a trifling cost. It consists of a top, about 1 inch thick, mounted on a sewing machine stand, across the bottom of which is fastened a platform to carry the motor. This top carries the bearing and hanger for the drive and spindle. The heads are made of hard wood and carry on one face a brass plate which is tapped to receive the thread on the spindle of the drive. Fitting somewhat closely to the rim of the head is an iron ring which serves to hold firmly in place a piece of cloth which carries the abrasive. For ordinary work but four heads are used, two of which are covered with canvas, one with felt, known as "weight 31¼," and one with either velvet or broadcloth. One of the canvas-covered heads is charged with flour emery paste and the other with washed flour emery paste; the third, or felt wheel, is charged with gold and silver rouge. The velvet wheel is used for finishing. In polishing, the specimen is given as high a finish as possible on the number one wheel and is then washed thoroughly in water and in alcohol. It is then put on the number two wheel and so on, care being taken to wash thoroughly after each grinding. The entire operation sometimes takes as little time as ten minutes.

Etching and Mounting Specimens.

After polishing, the specimen is ready for etching. This is done by means of some reagent which attacks or colors certain constituents of the metal more than it does others. The character of the etch figure is dependent upon the kind of reagant used and the manner in which it is applied, therefore it may readily be seen that there is at this point room for the display of considerable skill and ingenuity. As an illustration of this, let us look at a piece of copper etched with nitric acid, Fig. 4, and compare its structure with a similar piece of copper etched with ammonium persulphate, Fig. 5, or, to still further emphasize this point, compare this phosphide of iron which has been etched with cupric ammonium chloride followed by a mineral acid, Fig. 6, with Fig. 7, which I have copied from Law, and where acid only was used. After a proper etching and drying, the specimen is now ready for mounting and use is here made of a device which consists of two pieces of brass tubing of any convenient diameter which telescope and are ground to fit. The outer tube carries a brass strip of any desired width across its top and securely fastened to it, and which is centrally tapped to receive a screw threaded 20 threads to the inch. This screw has a milled head and is about an inch longer than the outer tube. This adjusting screw is fixed to the inner tube by means of a screw bottomed in it in such a manner that the inner tube can be readily raised or lowered, but cannot revolve. The inner tube should be of a length sufficient to give a good bearing and not be thrown off of level. The whole is set up on a base plate provided with a groove which receives the outer tube and which also carries two hinged clamps screwed into the plate and provided with set screws to lock the tube when in position.

Proper Illumination Necessary.

The method of use is as follows: A lump of modeling wax is stuck on any slide suitable for the purpose and the specimen set up in the proper position on the wax, the slide placed on the base-plate, the tube placed in the groove and clamped down and the specimen leveled perfectly by turning the milled head of the adjusting screw so as to bring the inner tube, which must, as a mechanical necessity, travel evenly, down on the specimen and forcing it into the wax, thus giving a serviceable mount and assuring a level surface for examination under the microscope regardless of the shape of the specimen. The set-screws are now released, the clamps thrown back and the specimen is ready for study. Since metallic objects are opaque and cannot be examined by transmitted light, it is necessary to make use of some special device in order to illuminate the specimen and get light through the barrel of the microscope to the eye. For this purpose, I have devised a piece of apparatus which is com-

[1]Read at the April 6 meeting of the Philadelphia Foundrymen's Association.
[2]Duplex Steel Co., Chester, Pa.

pact, readily adjusted, can be attached to any microscope having a society thread, and possesses the advantage of having the source of light always traveling with the barrel of the "scope." The device, Fig. 8, consists of an arm which locks to the microscope tube by means of a threaded collar. This arm serves to carry a condensing apparatus which consists of a telescope tube about 1 inch in diameter and which has a maximum extension of 4 inches and minimum of 2 inches. This tube is mounted in a sleeve provided with a set-screw to lock it in any position. Attached to this sleeve by means of a trunnion controlled by a set-screw is a hanger which permits the tube as a whole to be tilted at any angle. A vertical adjustment is provided for by means of a set-screw at the outer extremity of the arm. In the back of the telescope tube is mounted a spherical bi-convex lens, having a focal length of 1⅜ inches, and in the front of the draw tube is a plano-convex lens, having a focal length of 1¼ inches. The rear of the telescope tube carries a shield which is provided with clips to carry any desired color screen. Fastened to the shield is a light brass rod on which there is a movable carrier for an acetylene jet. This carrier consists of two pieces of brass tubing brazed together at right angles. Each piece of tubing is provided with a set-screw so that the source of light may be moved up or down, forward or back, turned on its own axis and set in any position and at any angle with reference to the plane of the rear lens; a method of mounting, which permits the use of any portion or all of the light from the thinnest edge to the fullest width. The acetylene jet is connected by means of rubber tubing with any form of generator that may be convenient. In place of the acetylene lamp a 6-volt tungsten light may be used, and although electric light does not possess all of the advantages of acetylene light, experience has shown that it is a fairly satisfactory substitute.

Applications of Instruments.

Screwed into the collar of the arm of the condensing apparatus is a Bausch & Lomb vertical illuminator. Below this is a quick acting nose-piece, made by the same firm, which permits of a ready change of objective without any change of alignment and which experience has shown to be preferable to the "revolving nose-piece." Fastened to the top of the microscope is a light-tight connecting tube, also made by Bausch & Lomb, inside of which is a sleeve to carry the eye-piece.*

*Arrangements have been made with the Arthur H. Thomas Co., of Philadelphia, to manufacture the apparatus here described.

This apparatus lends itself readily for use with either vertical or oblique illumination and permits the use of any power objective from the lowest to the highest. To illustrate this adaptability, let us examine a piece of wrought iron, Fig. 9, etched with nitric acid. The light with which this specimen was illuminated was vertical, that is, it was passed down through the objective at right angles to its surface and back to the eye by reflection. Note the character of the field and appearance of the various grains. Now let us look at the same section with an oblique illumination, Fig. 10, a most useful method for determining which constituent is in relief. It can be obtained with this apparatus by simply shifting the set-screw in the arm of the hanger, lowering the

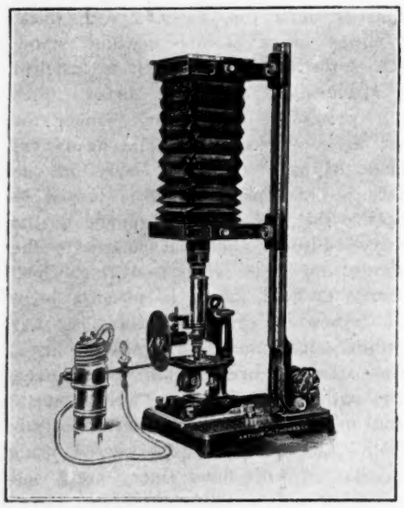


FIG. 8—MICROSCOPE ILLUMINATING APPARATUS.

illuminator and then tilting the tube in its trunnion.

Now as to some of the applications of such an instrument to metallurgy. It enables us to tell whether a steel casting has been properly annealed or not, and the character of that annealing, as in Figs. 11, 12 and 13. It affords a ready means of distinguishing between wrought iron, Fig. 14, charcoal iron, Fig. 15, and steel, Fig. 16, and between gray iron castings and cast steel. It is a most valuable guide to the effect of heat treatment on steel. In cast iron, it shows up the carbon segregations, as in Fig. 17, and other phenomena closely associated with the physics of that metal. In the study of segregation phenomena in steel and its attendant fatigue, it gives a deal of information which, if properly digested, may lead to a remedy. It shows up the presence of slag, Fig. 18, and segregations, such as the phosphides of iron, as illustrated by Fig. 19 which shows the phosphide segregation in relief after etching with cupric ammonium chloride. This particular section under a higher power, and after a further etching with nitric acid, is resolvable into at least three distinct compounds, Fig. 20, one of which is definitely crystallized and which I take to be the normal form of Fe_3P. It is interesting to note that this section suggests that phosphorus tends to segregate with some other metalloid, probably sulphur, and as a further illustration of this, let us look at Fig. 21, in which the sulphide is plainly visible and closely associated with the hieroglyphic markings of the phosphide. Not only does the sulphur tend to segregate with phosphorus, but it may segregate with silicate or it may occur alone as occluded masses of manganese sulphide, or we may find it forming an envelope to minute occluded particles of steel, as in Fig. 22. The microscope also gives a reason for failures which are otherwise difficult to account for, as may be shown in the micrograph of a piece of nickel steel, Fig. 23, which failed under a very low stress and it is well to note here the regularly arranged lines of strain set up by stress.

Studies of Non-Ferrous Metals.

The microscope applied to the study of the non-ferrous metals and their alloys will give an amount of information that cannot be obtained by any other method. It gives us information as to the distribution of dissolved oxide and its influence on the metal in cold drawing, as shown in Fig. 24, which is a picture of a section of a wire rod in relief. The lines of oxide are plainly visible and after etching and under a higher magnification they will show up like Fig. 25, thus affording an explanation of why certain coppers, whose conductivities are good, yield weak and defective wire. In the foundry it affords data as to the relation of the casting temperature to the physical properties of the product in that there is a progressive increase in the size of the grain as the temperature rises, as shown by Figs. 26, 27, 28 and 29. It gives a reason for the very remarkable physical properties of the product made by the Duplex Metals Co., who are successfully welding copper to steel in such a manner that it will stand the many methods used for working metals. The weld between the copper and the steel is perfect within the limits of a metallurgical process, as is shown by Fig. 30, of a 3 13-16-inch copper-clad bar rolled from a 6-inch billet. On the one side you will notice the copper, whose structure is not developed, on the other the steel, and between them you will notice the rootlets of the weld area penetrating the two metals and dovetailing them to-

gether. Rolling this bar to a ⅜-inch rod and developing the structure of the weld, Fig. 31, it will be noticed that there are at least three compounds visible in the weld area. On the copper side there is the copper-iron alloy, on the steel side there is the iron-copper alloy, and merging into each there is another substance which is very difficult to resolve, but which at a magnification of 1,530 takes the form seen in Fig. 32, and which is assumed to be a cupride of iron rather than a eutectic.

The tensile strength of copper-clad steel is noteworthy. Regarding the metal as having 40 per cent of its sectional area made up of copper its tensile strength in an annealed ⅜-inch rod will average 55,000 pounds per square inch with an elastic limit of 82 per cent of its ultimate. Steel rods of the same size and identical in composition with the steel forming the core of the copper-clad, annealed and pulled under similar conditions give between 54,000 and 56,000 pounds with an elastic limit of 74 per cent. Now accepting the statement that, other things being equal, the finer the grain in any metal the better its physical properties; a comparison of the structures of the all steel rod, Figs. 33 and 34, with that of the steel in the copper-clad rod, Figs. 35 and 36, all of which are at exactly the same magnification, the extremely fine grain of the copper-clad is at once apparent.

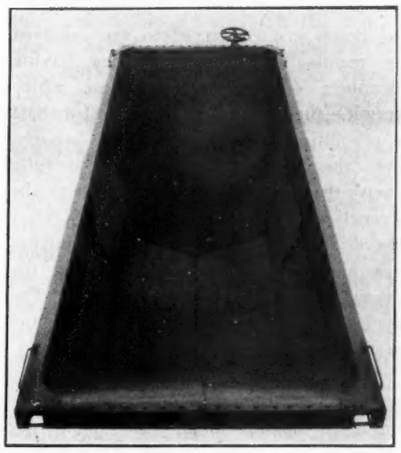
A NEW QUICK DUMPING ORE CAR.

Recently the question of a reduction in time and labor required to unload ore cars has become of more importance, principally through labor difficulties, but also to effect a more rapid loading of vessels as well as less detention of the cars, and the railroad companies have permitted a number of variations from the old standard dimensions which permits of obtaining better construction of the cars.

The Pressed Steel Car Co. has just completed a sample car representing a lot of 300 cars which it is building at its Chicago plant, the Western Steel Car & Foundry Co., for the Duluth & Iron Range, and the Duluth, Missabe & Northern railroads, in the construction of which is shown what can be done when hampering limitations are removed.

These cars, of which several views are presented, are of all steel construction, and have the following general dimensions:

Length over striking plates, 22 feet 1 inch.
Length inside of body, 18 feet 1¾ inches.
Width over side sheet, 8 feet 7 inches.
Width inside of body, 8 feet 6½ inches.
Height from rail to top of side, 9 feet 6 inches.



PLAN VIEW OF INTERIOR OF CAR.

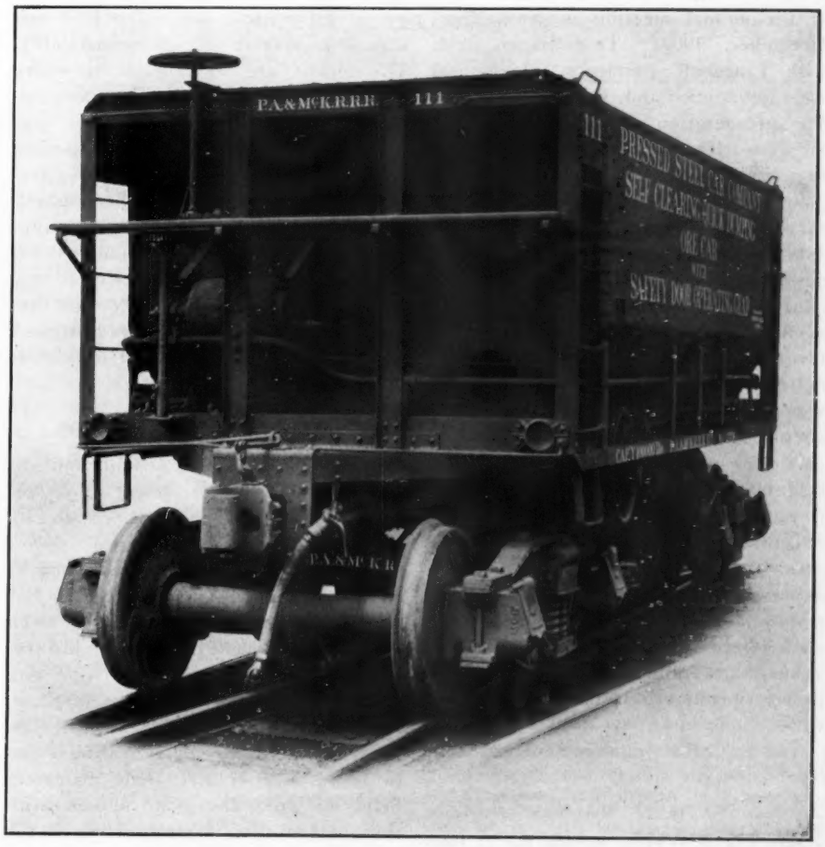
Height from rail to center of draw heads, 2 feet 10½ inches.
Length of door openings, 6 feet 7¾ inches.
Cubic contents, level, 686 cubic feet.
Cubic contents, 10-inch average heap, 802 cubic feet.
Weight of car and trucks, empty, 32,700 pounds.
Rated capacity, 100,000 pounds.
Maximum capacity, 120,000 pounds.
Ratio of paying freight to total weight of car loaded, 78.6 per cent.

The construction of the car is of single hopper center dumping type, and in order to make it self clearing and dispense with the necessity of poking the lading when unloading, the area of the bottom opening has been made very large, being about 50 square feet, and the slopes of the hopper sheets have been made very steep, being 50 degrees at the ends and 60 degrees at the sides from the horizontal.

These conditions were made possible without reducing materially the carrying capacity of the cars by increasing the height and width of the cars, reducing the wheel base of the trucks and spreading the trucks further apart from center to center.

The door opening is closed by two doors hinged at the sides, and form part of the vertical sides so that when opened, part of the sides, as well as the bottom, falls away from the load, thus making a large unobstructed opening, reducing the chance of bridging to a minimum. The doors meet on the center line of the car and each is supported by two 6-inch channel bars to which the door operating gear bars are attached.

The door operating gear is of a construction designed to be operated from either side of the car, besides it is so arranged that when the doors are closed and the car is loaded there is no strain on the winding gear proper; in other words, the supporting mechanism is self-locking and the load tends to keep the doors closed rather than to open them. This is accomplished by means



PRESSED STEEL CAR CO.'S QUICK DUMPING ORE CAR.

of cranks which turn over a dead center into a position of rest. The doors are connected to the cranks by heavy rods with screw attachment for adjustment in place of chains, this prevents stretching and guarantees that the doors will stay tight, and that there will be no leakage of ore in transit. Gears of this kind have given good service on coal cars, and have the further advantage that when the doors are frozen so that they can not drop by gravity they can be forced down by the connecting rods, which cannot be done with chain connections.

Another feature in connection with the door gear is a safety device absolutely positive in its action, which will prevent the injury of the operator when opening the doors. To operate the doors the usual wrench is applied to the square end of the operating shaft; the crank arms referred to are revolved by means of block clutches having clearance of half a revolution, which permits the cranks to revolve for half a revolution, after having been brought over the dead center, sufficient to fully open the doors without moving the wrench in the operator's hands. After the doors have been opened the clutches are in proper position for closing the doors, there being no lost motion. The arrangement is very simple, effective and readily understood.

Every detail of the car has been worked out to secure the greatest economy in maintenance; the doors are stronger and more heavily braced than has ever been the practice in the past, which is essential to prevent distortion from steam shovel loading, under which usage it is particularly difficult to keep the doors tight and prevent leakage of ore.

In a recent test at the Clinton furnaces, at Pittsburg, the sample car was loaded with 100,300 pounds of wet ore and was unloaded by one man. The time consumed by the ore in leaving the car was eight seconds. Not a handful of ore remained in the car, and no poking or hammering of the sides to loosen the ore was necessary, or resorted to, during the operation.

The car was afterwards loaded with 68,000 pounds of steel punchings; the load was placed directly over the doors and although this was a very severe test of the efficiency of the door gear, there was no sign of weakness or leakage.

BALL BEARING LINE-SHAFT HANGERS[1]

A Further Discussion of Line-Shaft Efficiency With Some Costs.

By Henry Hess.

This paper is presented because of a request for more specific information made during the discussion of a paper that I was privileged to read at the annual meeting in New York, December, 1909.[2] That paper dealt with Lineshaft Efficiency, Mechanical and Economic, and was restricted to the presentation of actual measurements of the power consumption of the same lineshaft when mounted on plain and again on ball bearings, with that change the only variable.

It was the purpose of the paper to describe merely the actual test and its results, thus adding to the fund of available engineering knowledge. The favorable economic showing of the ball-bearing is inherent in the advantages of rolling as compared with sliding friction, quite aside from any particular make of ball-bearing; though if durability as well is to be secured, it naturally is essential that bearings of correct design and suitable workmanship and material be selected. The demand at the time of the discussion and since must serve as apology for such references to a product for which I am responsible as are incident to a description of the installation in question.

The first real improvement in hangers was made in this country by one of the oldest and most honored members of our society. It was Mr. Bancroft who first mounted the box to swivel fully while well supported and who also gave it vertical adjustability. The means are so familiar to every one today as to constitute a commonplace. This original hanger was supplied with carefully fitted adjusting screws of liberal size; their ends terminated in correctly machined spherical sockets fitting over correspondingly machined spherical segments on the top and bottom of the box. Once adjusted in the hanger the box retained its place until a readjustment was demanded by some outside cause, such as a settling building.

Failure of Standard Designs.

Unfortunately the constant and incessant demand for lower and yet lower costs was given heed to by many until in course of time not a few of the many makes of hangers marketed are not machined at all, but are foundry jobs throughout. Even so the consequent looseness and indefiniteness of position of the box supporting screws is not a very serious matter with plain bearings. The very length of the plain bearing equal to some four or five shaft diameters helps to hold the box in line with the shaft if that is straight; or if the deflecting forces are too great, then the resultant excessive pressure on the plain bearings will draw attention to the trouble and by an insistent squeal, demand correction.

In first applying ball bearings to lineshafts I employed various hangers such as were on the market. The ball bearing was set in an enclosing box which in turn was held between the same supporting screws that supported the plain bearing displaced. Occasional reports were received that the power consumption was greater after the change than before. These were particularly insistent from a few installations where accurate meter records of electrical power consumed by the shaft driving motors were kept. Investigation finally disclosed in each instance a shifting of the shaft sections from their original alignment. The consequent and in several cases quite severe binding of the shaft at each revolution consumed considerable power. Owing to the very low coefficient of ball bearing friction, 0.0015, however, the additional load on the ball bearings was without evident effect and caused neither squealing nor even perceptible heating. Realigning the boxes immediately brought down the power consumption to the original low figure.

The Bancroft, or as they are better known, "Sellers" type hangers with their definitely machined supporting screws and sections of spheres

[1]Presented at Atlantic City meeting of the American Society of Mechanical Engineers, May 31, 1910.

[2]See The Iron Trade Review, Dec. 23, 1909; April 7, 1910.

on the outside of the box to rock on, was not found practicable with ball bearings, because these spherical sections became too flat with the large diameter of the box containing the ball bearing, as is evident from an inspection of the cross section of such a box given in Fig. 1.

It was finally and reluctantly decided to make up and build hangers, general co-operation with the specialists in that line having been found impossible from lack of interest, reluctance to make changes, the usual inertia resisting innovations, etc.

Many designs were laid out on paper and some tried, but again discarded as not responding to all of the following requirements of an ideal hanger:

a Definite support of the box on machined seats permitting no shifting under load.

b Ability of the box to swivel in all directions.

c Vertical adjustability of the box within the hanger body.

d Horizontal adjustability of the box within the hanger body.

e Rigidity in every direction, to permit the hanger to be used as a ceiling hanger, floor stand or post hanger.

f Convenience of adjustment in aligning the shaft.

g Adaptability for countershaft hangers involving a shifter-arm.

h Neatness of general outline and conformity to modern machine design by substituting box sections for ribbing.

i The lowest cost consistent with the other requirements.

The design finally evolved is shown in Fig. 1. The box is supported and pivoted horizontally on the ends of two screws tapped through the opposing sides of a yoke surrounding the box with enough freedom to give 1 inch of horizontal adjustment. This yoke has an upper and lower cylindrical stem, each turned to a running fit in the corresponding bore of the hanger; these stems are threaded and provided with nuts and checknuts and allow a vertical adjustment of 2 inches. As the box can swivel horizontally in the yoke and that in turn vertically in the hanger the two together provide the desired universal swivelling freedom.

The hanger body is of channel section with the flat outside. The central crossbar that takes the weight of the box and shaft also materially stiffens the hanger. The lower crossbar is cast integrally with the hanger body and split off in the usual way. A single bolt at each end serves for attachment. This bolt is a drop forged T with the T turned down and ball ended to fit in corresponding sockets.

All of the various sizes, with the exception of the largest, which never comes into consideration for countershafts, are provided with cast-on lug with a serrated side face. To this may be bolted an arm of suitable length at any desired angle, to carry the usual eye guiding the shifter rod.

The construction of the bearing box is also apparent from Fig. 1, which shows it to consist of a central cast supporting ring bored to a sucking fit for the outer race of the ball bearing. To the side faces coverplates are bolted with an oil-tight joint, and where these surround the shaft they are provided with a cored annular groove. The side lips are bored 1/64 inch larger than the shaft diameter and have sharp edges.

This arrangement is found to be efficient in retaining the lubricant and so promotes cleanliness, while also preventing the entrance of ordinary foreign matter. For particularly difficult locations, as in cement mills, the very fine floating grit is kept out by a double groove, the outer one of which is filled with a fairly heavy grease. A single charge of heavy cylinder oil or non-acid grease will last the average lineshaft bearing several years; and to avoid total neglect refilling once a year is recommended.

The ball bearings are free endwise in the box. It is recommended that a lineshaft be held endwise by ordinary collars on either side of the central hanger so that all weaving endwise, due to expansion and contraction, settling, etc., is allowed for by the end freedom in the boxes. An occasional installation is found with heavy end-thrust, in which case the thrust is taken on one of the ball bearings by letting it come up against the shoulders of the coverplates. Unusually heavy thrusts are provided for by special hangers into which a collar type of ball bearing is built.

As it is necessary to clamp the ball bearing to the shaft so that the inner race cannot rotate and as commercial shafting is somewhat indeterminate in size, a so-called "adapter" is employed, the details of which are shown in Fig. 2. The adapter consists of a bush fitting into the bore

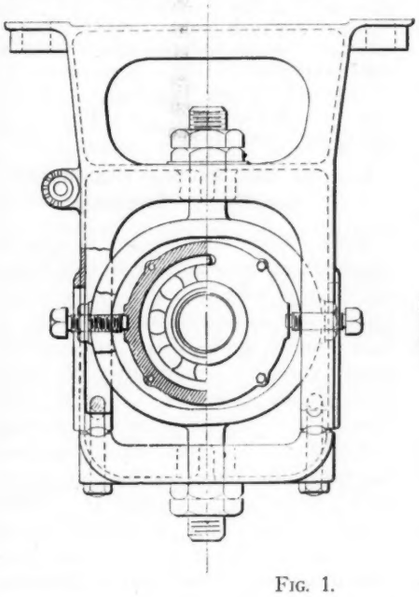


FIG. 1.

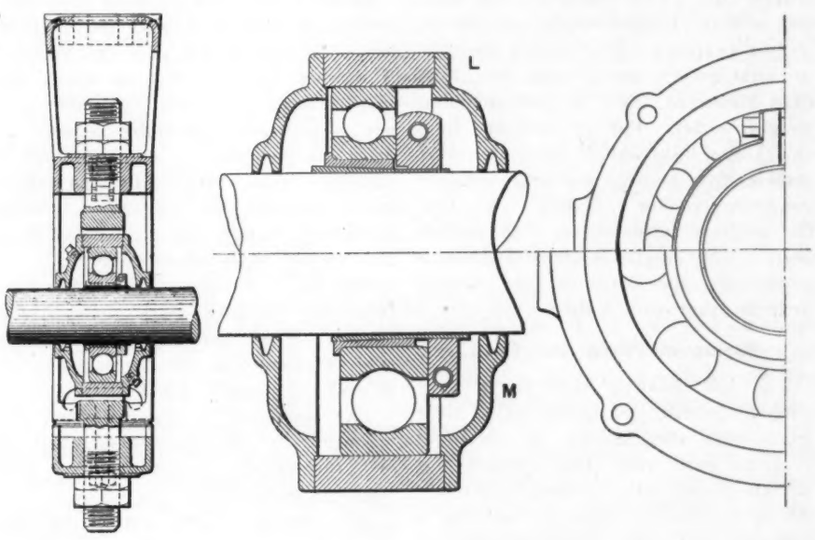


FIG. 2.

of the inner race, which in turn is fitted with a coned split sleeve. This latter is driven home endwise until the whole is tightly clamped onto the shaft, retaining a truly concentric setting. Unless there is considerable vibration, the wedging effect of the small angle of the conical bush is sufficient to prevent any loosening, but to guard against all contingencies a split collar is clamped onto the sleeve with its face close up to the face of the bearing.

In the sectional view, Fig. 2, that part of the bearing above the center line appears narrower than that below, the first marked "L" and the latter "M". This indicates the relative widths of light-weight and heavy-weight bearings. Bearings of the "L" or light-weight series take less load than those of the "M", or medium-weight, series. For all ordinary lineshafts the light-weight series is quite sufficient; it is only for extraordinary conditions or for jackshafts, etc., that the medium series comes into consideration. A single medium bearing is sometimes also used in the hanger next to the main belt.

Saving in Power and Cost.

The ball bearing itself is a very simple element, consisting, as is clear from both illustrations, of an inner race, an outer race, and a single row of interposed balls, running in grooves whose radius of curvature is only a few per cent larger than the ball radius. Races and balls are made of alloy steels (a special mixture of the carbon, chrome, manganese variety).

These ball bearings are the same that are regularly supplied for the machine industries in general. Adapters for shafting range from 15/16 inch to 3 15/16 inches both light and medium. As larger shafts are rarely of the nature of lineshafts it is preferable to fit seats directly to the bearing bore without the interposition of adapters.

In the paper referred to at the outset direct measurements were cited showing a saving in lineshaft friction of about 35 per cent under proper belt tensions of 44 pounds to 57 pounds per inch width of single belt, and correspondingly more for heavier loads. The return on the investment was also shown to be 37 per cent per annum, taking into account the higher cost of the ball bearing installation. Such higher cost is, however, not necessary. The initial cost may, in fact, be actually lower if in the original layout full advantage is taken of the possibilities of the ball bearing. The ball bearing is as safe and reliable at 600 revolutions per minute as at 200; whereas, the use of such high speed with plain bearings is beset with so many difficulties in the way of reduction of size of lineshaft, pulleys, drop of hangers, etc., as to take that practically out of consideration for the average plant. The first cost of a ball bearing installation of 600 revolutions per minute compares favorably with the first cost of one at 200 revolutions per minute on plain bearings and the full advantage of the saving to be derived from ball bearings may thus be realized without any extra investment whatsoever.

In fact, the first cost of the ball bearing equipment is quite likely to be less. As an example, it is fair to take a lineshaft such as that on which the test referred to in the December paper was made, but fully loaded to drive 32 machines. The installation elements that vary with the shaft speed are the shaft diameters, pulley diameters, hanger drops, belt widths and countershaft-driven pulleys.

The net cost of the installation material for the slow speed shaft of 200 revolutions per minute on plain bearings transmitting 40 horsepower is $558.95.

The net cost of the alternate installation for the high speed shaft of 600 revolutions per minute on ball bearings is $441.87.

The saving in first cost of material amounting to 21 per cent, $117.08.

The lineshaft bearing friction saving, based on an average coefficient of friction and confirmed by the series of tests cited in the previous paper, is 0.41 kilowatt or 1,230 kilowatt-hours for a year of 3,000 working hours and worth, at 3 cents per kilowatt-hour, $36.90; secured by an installation 21 per cent lower in initial cost. The detailed cost of both equipments is given herewith.

Cost of Plain-Bearing Slow-Speed Line-Shaft Material.

Shaft 200 revolutions per minute in ring-oiling boxes, transmitting 40 horsepower, driving 32 countershafts, one belt to each countershaft, 8 feet to countershaft centers, countershafts 300 revolutions per minute.

10 hangers, 16-inch drop, ring-oiling babbitted boxes, net cost, $53.63.
1 main pulley, 40 x 12½-inch double belt.
4 line pulleys, 15 x 6¾-inch single belt.
4 line pulleys, 8¾ x 4½-inch single belt.
4 line pulleys, 10 x 4¾-inch double belt.
4 line pulleys, 9⅞ x 5½-inch single belt.
4 line pulleys, 9¾ x 7¾-inch double belt.
4 line pulleys, 8¾ x 4½-inch single belt.
4 line pulleys, 10 x 4¾-inch double belt.
4 line pulleys, 12¼ x 4½-inch single belt.
4 counterpulleys, 10 x 6¾-inch.
4 counterpulleys, 6 x 4½-inch.
4 counterpulleys, 6¾ x 4¾-inch.
4 counterpulleys, 6½ x 5½-inch.
4 counterpulleys, 6½ x 7¾-inch.
4 counterpulleys, 6 x 4½-inch.
4 counterpulleys, 7 x 4¾-inch.
4 counterpulleys, 8 x 4½-inch.
Net cost, $117.97.
20-foot 12-inch double belt.
320-foot 3-inch single belt.
160-foot 3-inch double belt.
80-foot 3¾-inch single belt.
80-foot 4-inch double belt.
Net cost, $360.10.
72-foot 2 7/16-inch lineshaft.
Net cost, $27.25.
Total net cost, $558.95.

Cost of Ball Bearing High-Speed Line-Shaft Material.

Shaft 200 revolutions per minute in Hess-Bright medium series ball bearings, transmitting 40 horsepower, driving 32 countershafts, one belt to each countershaft, 8 feet to countershaft centers, countershafts 300 revolutions per minute. Lineshaft pulleys reduced in diameter by one-half and the driven countershaft pulleys increased in diameter by one-third; belts decreased in width in correspondence with the increased speed; lineshaft decreased in diameter proportionately to speed; under both conditions safe for 60 horsepower, according to catalog ratings. Hanger decreased in drop to 10 inches, rather more than the diameter of largest counterdriving pulley. Belts 50-pound per inch width, single.

10 hangers, 10-inch drop, medium weight ball bearings, net cost, $159.20.
1 main pulley, 28 x 6½-inch double belt.
4 line pulleys, 7½ x 4½-inch double belt.
4 line pulleys, 6 x 3½-inch single belt.
4 line pulleys, 5 x 2½-inch single belt.
4 line pulleys, 5 x 2¾-inch single belt.
4 line pulleys, 5 x 4½-inch double belt.
4 line pulleys, 6 x 2-inch single belt.
4 line pulleys, 5 x 3-inch single belt.
4 line pulleys, 8 x 2-inch single belt.
4 counterpulleys, 15 x 4½-inch.
4 counterpulleys, 12 x 3½-inch.
4 counterpulleys, 10 x 2½-inch.
4 counterpulleys, 10 x 2¾-inch.
4 counterpulleys, 10 x 4½-inch.

4 counterpulleys, 12 x 2-inch.
4 counterpulleys, 10 x 3-inch.
4 counterpulleys, 16 x 2-inch.
Net cost, $87.57.
20-foot 6-inch double belt.
240-foot 2-inch single belt.
240-foot 1½-inch single belt.
80-foot 2½-inch single belt.
80-foot 2¾-inch single belt.
Net cost, $162.
72-foot 1 11/16-inch lineshaft.
Net cost, $13.10.
Total net cost, $441.87.

Estimate of Savings in Kilowatts.

In the author's paper on Lineshaft Efficiency, published in December, 1909, is given: Kw. = 0.0000059 $Ld s \mu$

L = total journal load in pounds = 9,606 plain bearings, 5,420 ball bearings.

d = shaft diameter in inches = 2 7/16 inches plain bearings, 1 11/16 inch ball bearings.

s = shaft speed in revolutions per minute = 200 plain bearings, 600 ball bearings.

μ = coefficient of friction = 0.03 plain bearings, 0.0015 ball bearings.

Kw. = kilowatt friction loss = 0.90. plain bearings, 0.49 ball bearings.

Kw., plain = 0.0000059 × 9,606 × 27/16 × 200 × 0.03 = 0.90.

Kw., ball bearing = 0.0000059 × 5,420 × 1 11/16 × 600 × 0.0015 = 0.49.

Kw. saving = 0.90 — 0.49 = 0.41.

MANUFACTURERS' STANDARD SPECIFICATIONS FOR HOT ROLLED BARS.

The following specifications governing the allowable variations in the various sizes and sections of hot rolled bars have been adopted by the Association of American Steel Manufacturers. Copies may be obtained from the secretary, Jesse J. Shuman, care Jones & Laughlin Steel Co., Pittsburg.

Specifications have also been adopted for concrete reinforcement bars as follows:

Manufacture.

1. Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.

Chemical and Physical Properties.

2. The chemical and physical properties shall conform to the following limits:

Properties Considered.	Structural Steel Grade. Plain Bars.	Structural Steel Grade. Deformed Bars.	Hard Grade. Plain Bars.	Hard Grade. Deformed Bars.	Cold-Twisted Bars.
Phosphorus, maximum, Bessemer	0.10	0.10	0.10	0.10	0.10
Open-hearth	0.06	0.06	0.06	0.06	0.06
Ultimate tensile strength, Pounds per sq. in.	55/70,000	55/70,000	80,000 min.	80,000 min.	Recorded only
Yield point, maximum, Pounds per sq. in.	33,000	33,000	50,000	50,000	55,000
Elongation, per cent in 8 inches, minimum	1,400,000 / T. S.	1,250,000 / T. S.	1,200,000 / T. S.	1,000,000 / T. S.	5%
Cold bend without fracture:					
Bars under ¾ inch in diameter or thickness	180°d.=1t.	180°d.=1t.	180°d.=3t.	180°d.=4t.	180°d.=2t.
Bars ¾ inch in diameter or thickness and over	180°d.=1t.	180°d.=2t.	90°d.=3t.	90°d.=4t.	180°d.=3t.

The hard grade will be used only when specified.

Chemical Determinations.

3. In order to determine if the material conforms to the chemical limitations prescribed in paragraph 2 herein, analysis shall be made by the manufacturer from a test ingot taken at the time of pouring of each melt or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.

Yield Point.

4. For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.

Form of Specimens.

5. (a) Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least 9 inches if deemed necessary by the manufacturer in order to obtain uniform cross-section.

(b) Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (c), in which case the conditions therein stipulated shall govern.

(c) If it is desired that the testing and acceptance for cold-twisted bars be made upon the hot-rolled bars before being twisted, the hot-rolled bars shall meet the requirements of the structural steel grade for plain bars shown in this specification.

Number of Tests.

6. At least one tensile and one bending test shall be made from each melt of open hearth steel rolled, and from each blow or lot of ten tons of Bessemer steel rolled. In case bars differing ⅜ inch and more in diameter or thickness are rolled from one melt or blow, a test shall be made from the thickest and thinnest material

Standard Allowable Variations in Weight of Bar Sizes of Angles, Tees, Zees and Channels.

For bar sizes of angles, tees, zees and channels the following average variations in weight will be permitted for sections of the various dimensions and thicknesses stated, viz:

Dimensions.	Thickness.	Variation in Weight.
Any dimension over 1½ inch	Over 3/16 inch	4% over and under
All dimensions 1½ inch and less	Over 3/16 inch	5% over and under
Any dimension over 1½ inch	3/16 inch and less	6% over and under
All dimensions 1½ inch and less	3/16 inch and less	7% over and under

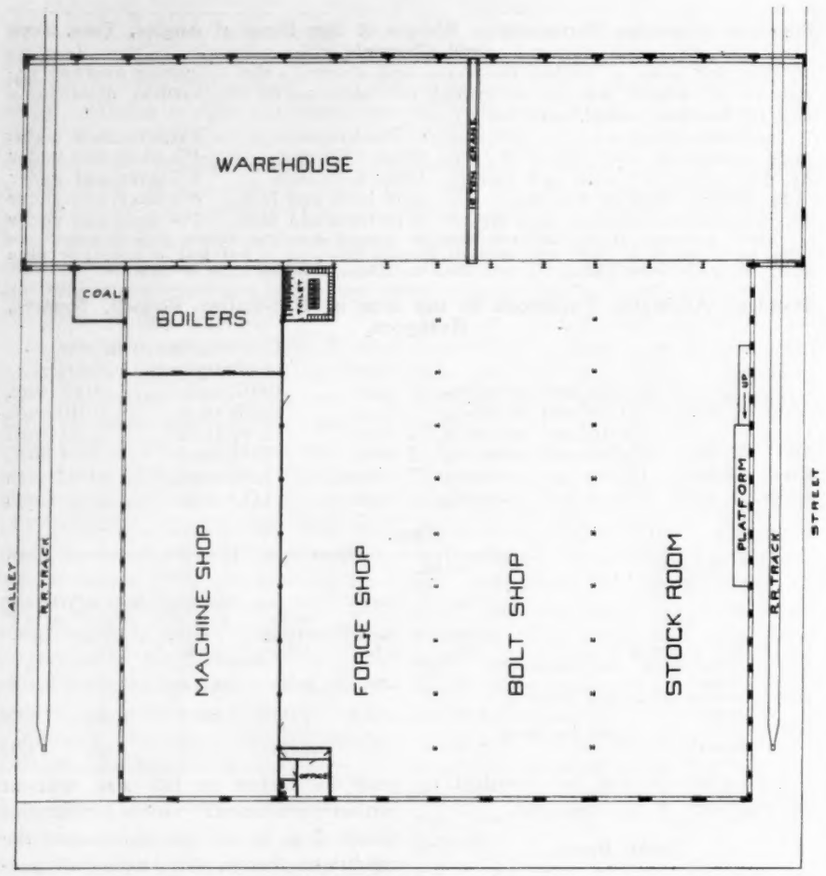
Note. A channel is in "bar" size when its greatest dimension is less than 3 inches. An angle, tee or zee is in "bar" size when its greatest dimension is less than 3 inches; or when it is 3 inches or more and at the same time the thickness is less than ¼ inch.

Standard Allowable Variations in the Size of Hot-Rolled Rounds, Squares, Hexagons.

		Variation in size Under	Variation in size Over
	Up to and including ½ inch	0.007 inch	0.007 inch
Over ½ inch.	Up to and including 1 inch	0.010 inch	0.010 inch
Over 1 inch.	Up to and including 2 inch	1/64 inch	1/32 inch
Over 2 inch.	Up to and including 3 inch.	1/32 inch	3/64 inch
Over 3 inch.	Up to and including 5 inch	1/32 inch	3/32 inch
Over 5 inch.	Up to and including 8 inch	1/16 inch	⅛ inch

Flats.

Width of Flats.	Variation in Width. Under	Variation in Width. Over	Variation in Thickness, Under and Over. 3/16" and under	Over 3/16" up to ¼"	Over ¼" up to 1"	Over 1" up to 2"
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
Up to and including 1 inch.....	1/64	1/32	0.006	0.008	0.010	
Over 1 inch up to and including 2 inches	1/32	3/64	0.008	0.012	0.015	1/32
Over 2 inches up to and including 4 inches	3/64	1/16	0.010	0.015	0.020	1/32
Over 4 inches up to and including 6 inches	1/16	3/32	0.010	0.015	0.020	1/32



GROUND PLAN OF O'LEARY & SON CO.'S SHOP.

rolled. Should either of these test specimens develop flaws, or should the tensile test specimen break outside of the middle third of its gaged length, it may be discarded and another test specimen substituted therefor. In case a tensile test specimen does not meet the specifications, an additional test may be made.

(d) The bending test may be made by pressure or by light blows.

Modifications in Elongation for Thin and Thick Material.

7. For bars less than 7/16 inch and more than ¾ inch nominal diameter or thickness, the following modifications shall be made in the requirements for elongation:

(e) For each increase of ⅛ inch in diameter or thickness above ¾ inch, a deduction of 1 shall be made from the specified percentage of elongation.

(f) For each decrease of 1/16 inch in diameter or thickness below 7/16 inch, a deduction of 1 shall be made from the specified percentage of elongation.

(g) The above modifications in elongation shall not apply to cold-twisted bars.

Number of Twists.

8. Cold-twisted bars shall be twisted cold with one complete twist in a length equal to not more than 12 times the thickness of the bar.

Finish.

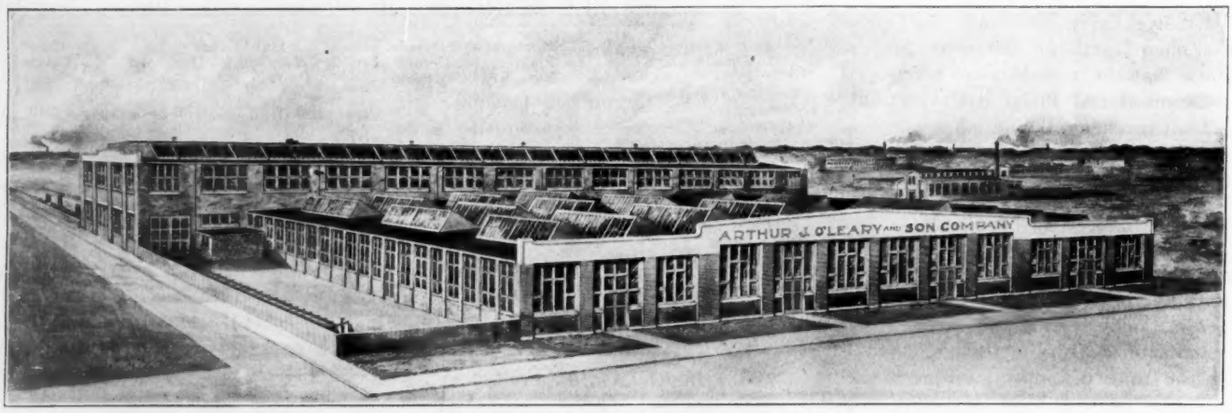
9. Material must be free from injurious seams, flaws or cracks, and have a workmanlike finish.

Variation in Weight.

10. Bars for reinforcement are subject to rejection if the actual weight of any lot varies more than 5 per cent over or under the theoretical weight of that lot.

THE NEW O'LEARY PLANT AT CLEARING, ILL.

Announcement was recently made in THE IRON TRADE REVIEW that the Arthur J. O'Leary & Son Co., Chicago, had purchased property in the Argo-Clearing district, just outside of the southwestern city limits of Chicago. The company has completed its plans for buildings, the arrangement of which is shown in the accompanying illustrations. The location of the O'Leary plant at Clearing is another illustration of the growth of the iron and steel business in Chicago, and of the increasing importance of that city as a distributing center. The company had a very modest beginning in 1874, when the firm of Smith & O'Leary operated a small forging and blacksmith shop in Irondale, moving to Clinton street inside of a year, and about 1880 to Lake and Desplaines streets, the present location. In 1903 the Arthur J. O'Leary & Son Co. was incorporated. the original business, that of the manufacture of forgings, was enlarged in 1899 to include the manufacture of bolts, and in 1904 the company added



GENERAL VIEW OF NEW PLANT OF A. J. O'LEARY & SON CO.

a stock of bolts, nuts, washers, bar iron and steel, and has since continued to do a jobbing business in those lines, in addition to its forging department. Last year the company began the erection of a concrete building on the western end of its Lake street property, which will be retained for its jobbing business, and the general offices will continue to be at that location as well as the city warehouse and facilities for light manufacturing.

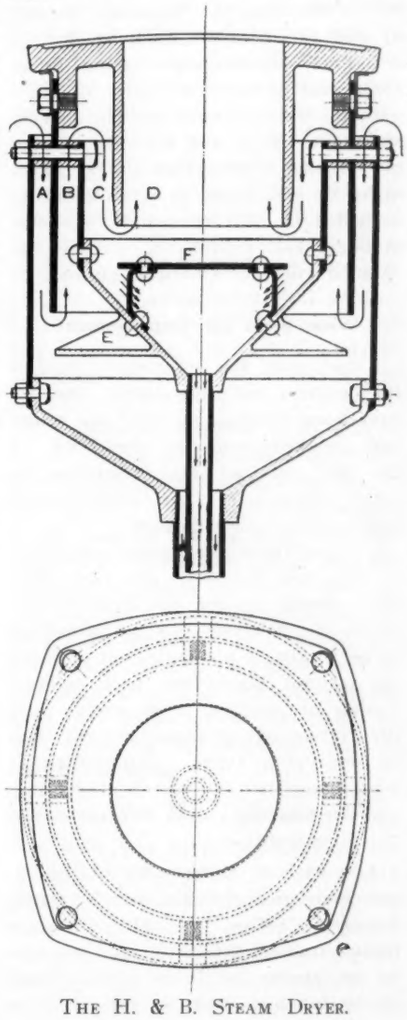
The property which the company has acquired at Clearing has a street frontage of 300 feet and a depth of 720 feet. The main warehouse building parallels the street front, 200 feet back from the building line. It will be 300 feet in length by 80 in width, built of brick, steel and concrete, with a large area of glass. The top light will be furnished through ribbed wire glass, placed so as to effectively light the entire room. This building will be 30 feet in height to the underside of the trusses and will be equipped with a 10-ton electric crane, traveling its entire length. Railroad tracks pass through both ends of this warehouse so that material may be received at one end and shipped from the other. Certain classes of stock will be sheared in this warehouse at points accessible to the forge and bolt shops.

Running from the warehouse to the street front are four principal departments 60 feet by 200 feet each and 18 feet in height to the underside of the trusses, for machine shop, forge shop, bolt shop and bolt-stock room, three of these departments opening into the warehouse proper. The bolt stock is received from freight cars on a platform at car height, this platform being located inside of the building because of limited space outside and is reached by an inclined runway. The bolt-stock room will serve the bolt-heading department, the forge and steam hammer room receiving its stock from the warehouse; the steam hammers are conveniently located near the boilers. Fuel for the latter is delivered from freight cars on the side track, but provision also has been made for utilizing the waste heat from the forge fires for generating steam. The machine shop is separated from other departments by a partition, and this room, together with the office and toilet, will be the only rooms requiring heat.

The office is located at the entrance door and is easily accessible to all departments. The shop toilet, wash and locker room is centrally located at a point easily protected from frost and accessible from two sides.

The provision for future expansion contemplates an additional warehouse at the rear of and adjoining the present one, and from that proposed warehouse four other departments are to be built to the rear, similar in character to those provided in the front.

An unusual amount of natural light and ventilation is provided for the various shop departments. The street front and pilaster returns will be laid in paving brick in contrast with the reinforced white concrete belt, and it is expected that the buildings will be ready for occupancy by next October. The plans were prepared by Raeder & Wood, architects and engineers, of Chicago.



THE H. & B. STEAM DRYER.

A NEW FORM OF STEAM SEPARATOR.

The effects of entrained moisture in steam on the valves and working parts of steam engines is too well known to need comment. Engineers, operators and builders for many years have given much attention to the question of dry steam, realizing that to obtain the highest efficiency, means for eliminating moisture from steam must be employed.

A new device for preventing priming and for furnishing engines with dry steam, is being manufactured by the Hageman & Broderson Co., Chicago, and placed on the market through Ed. C. Garratt & Co., 25 South Clinton street, Chicago, selling agents.

The device, known as the H. & B. Steam Dryer, is illustrated in section in the accompanying figure. It is attached to the shell of the boiler directly under the main stop valve and is held in position by four studs.

In operation, the device makes use of the well known principle of the relatively much greater inertia of water than of steam when the velocity of flow is suddenly reduced. Referring to the illustration, the steam enters through the annular space, *A*, which is equal in area to that of the outlet pipe and, as shown by the arrow, turns upward through the annular passage, *B*. The much greater area through the chamber under the division plate between *A* and *B* reduces the velocity, throwing the water under the baffle, *E*, and causing it to return to the water level, where it can be properly evaporated. The steam then descends at higher velocity through the smaller annular passage, *C*, and from thence into the large space, *D*, from which it is led out. Any moisture that may have passed *E* is caught by the baffle, *F*, and expelled.

It is said that the separator has been installed on several vessels on the Pacific and Atlantic coasts and in practice is said to take steam with 10 per cent or more of moisture and deliver steam with less than 1 per cent moisture.

REMARKABLE RUN OF A CRUCIBLE FURNACE.

The Colonial Steel Co., of Pittsburg, furnishes information regarding a remarkable record made by a 24-pot Siemens furnace in their plant. The furnace is worked exclusively on artificial gas and was heated up in September, 1908, making its first heat Sept. 14, 1908, and its last heat on May 4, 1910. During the one year, seven months and twenty days in which it was in operation it made a total number of 2,561 heats, while the amount of steel melted was 6,644,640 pounds of both low and high carbon tool steel and alloy steels. Between Sept. 14, 1908, and May 4, 1910, the furnace was not melting for about 10 weeks, during which time the melting department was shut down, but it was kept warm continuously and never allowed to get cold. The top row of bricks on the front of the furnace was replaced twice, but the back of the furnace has never been replaced.

THE FUTURE OF THE AUTOMOBILE BUSINESS WITH REFERENCE TO MACHINE TOOLS[1]

Conditions Determining the Design and Operation of Machine Tools From the User's Viewpoint.

By Robert Pierpont.

Before considering the question which the subject of this talk would imply, I think a statement in regard to the automobile business in general would not be amiss.

As you no doubt all know, the state of Michigan is the automobile state today, and I think it safe to say that more automobiles will be made in Michigan in 1910 than in all the other states combined.

The industry has grown by leaps and bounds almost beyond comprehension. It is now one of the large industries and its influence is felt all over the United States.

We hear the question asked sometimes, "Is it going to last?" Before answering that question let us stop and consider for a moment the additions and equipments which have been brought together in some of the allied industries, and the value of their yearly product. Think of the number of automobile tire manufacturers; the amount of steel the mills are turning out and the experiments they are conducting for the benefit of the automobile manufacturer; the increase in floor space and capacity of the foundries and rolling mills and the provisions they have made for handling the enormous increase of the automobile requirements. These are all outside of the so-called automobile manufacturers. Then look at the class of buildings which the manufacturers themselves are erecting; not cheap buildings, but substantial brick and steel structures. Does it look as though they thought it a bubble to be pricked in a moment and burst? Business men and capitalists generally think well of the business and there is no lack of capital for any reasonable undertaking.

The Outlook.

We have been making automobiles in this country since 1895. The estimated value of all the automobiles produced in that year was about $160,000. This year, or the season of 1909 and 1910, the estimated value is $250,000,000. It is safe to say that we will make about 200,000 automobiles this year, which is more than the entire product previous to this season. We have improved the construction to such an extent that while a few years ago the automobile was a luxury for the rich, it has now become a necessity for the man of moderate means, as well as a pleasure giver to all. As it is not an uncommon thing today for a man to have two, three or more automobiles, I cannot see the end in sight yet. With the millions of people in the United States (just how many we will know in a few months) it will take, not thousands of automobiles, but millions to satisfy the demands of the American public.

Wide Field for Improvement.

I feel, with the commercial end of the business but well started, that we have been winding up over the rough and crooked roads to the brow of the hill and are just beginning to catch glimpses of the large, fertile fields in the valley beyond.

I do not think the present conditions of the tool business are just what they should be for the best results. With the deliveries so far ahead as to be almost, if not quite, out of sight, one cannot blame the tool builders if they are putting more energy into the getting out of machine tools than to improving them. Competition is what brings out the best in everything, and with business as it is there is not much competition.

You wish to know some of the requirements of the automobile manufacturers. Now, we like to have things studied out for us and brought in for approval. It is a great deal easier for me to sit in my office at the Olds Motor Works, Lansing, and tell you whether or not I like what you are making, than it is for me to stand here and tell you what you ought to make.

There is a wide field for new machine tools in the automobile business of today. We are far from being in the position of the superintendent of a large hardware concern of Connecticut, who told me they had cut their piece work prices as low as they thought their men could live comfortably on and there was no way for them to cheapen their product but in the making of special and automatic machinery. But we cannot refuse to be interested in further inquiry, as competition will surely drive us to it sooner or later, whether we will or not.

Where we are making such large numbers of automobiles there is a great saving in the use of special machinery, even if used but for one season. The large output of one model helps this, as we could well afford to spend $30,000 to experiment and make the tools for a rear axle if we were making 20,000 cars, as it would mean only $1.50 per car and would save several times that, but on 1,000 cars it would be $30 per car.

In regard to special machinery designed for special purposes, it has usually been considered by a salesman a good argument to say that the entire cost of the machine can be saved in one season's business, in comparison with the cost of doing the same operation on a standard machine. I am strongly in favor of special machines, which do pay for themselves in this way, provided they are simple and easy to operate and not liable to get out of repair.

Special vs. Standard Machines.

We have two extremes of opinion in regard to special machinery. A friend of mine, who formulates the policy of a large automobile concern, keeps selling his old machinery to buy new, as fast as something which he thinks is better comes out; consequently, he does not believe in very much special machinery, as he would not be able to sell it as readily as he does the standard tools. Others go to the other extreme and will buy special tools for everything, as fast as they come out, whether there is much of a saving or not. I hardly think either extreme is the better policy. It seems to me there is a large field for standard machines, somewhat simplified, to be used for special purposes; these to be sold at a cheaper price in quantities, but so built that the full complement of attachments could be added at any

[1]Address delivered at Rochester Convention National Machine Tool Builders' Association, May 24, 1910.

[2]Works manager, Olds Motor Works, Detroit.

time desired. This brings up a point which I wish to emphasize, which is *simplicity*.

In Michigan we do not have all high class mechanics, but are forced to bring in farmers' boys, and even the farmers themselves, during the winter months, and try to make machine men out of them. A great many of the machines we have are so complicated that it takes a long time for such men to learn to operate them. With the rapid increase of manufacturing, and the great demand for machinists, it is almost impossible to get enough competent me to run the machines properly. I think we need simpler machines with fewer feeds and speed changes, rather than machines more complete and complicated. In the ordinary use of machinery it is not necessary to have quick-change gears, as the majority of our men run day after day on the same piece or cut, and in getting out pieces in large numbers it is more advantageous to keep a man doing a certain piece of work, as he is apt to do better work and more of it the longer he is at it. The adjustments of the bearings should be simple and easy to understand and operate. Good foremen are getting scarce and we need machines which will require but little attention.

Where Silence is Golden.

Referring again to the gearing of the machines, both for driving and speed changes, I notice that our machine shops are continually becoming more noisy, and I think you will agree that when we want a man to do a really nice job we get him off in some quiet place to work. The noise of gears running and shifting distracts the attention of men from their work, and it takes them a long time to get used to it; especially is this true of unskilled labor. This is another reason why I would favor a more simple machine, which would also be more quiet in operation.

Still another reason why I am in favor of the special machine for doing the work faster and more accurately is in taking care of repair parts. The time is already here for some of the automobile manufacturers, and will come to all of the large producers, when they will not be able to take care of the repair parts for outstanding cars in the regular production shops, but will have to make special departments where these repair parts can be produced. If we have any special machinery used in this year's product, but not in next, we can turn this machine over to that repair department and continue to make these pieces at a cheaper cost than could be done on standard machines, which will all go to help the upkeep for the car owners.

The Olds Motor Works has been continuously making automobiles since 1898. That was the day of the little runabouts, some of which can still be seen running, and we realize the importance of the repair department more than some of the concerns who are only one or two seasons old.

A Use For Old Machines.

I think a wise plan is also, instead of selling old machinery, to which all the special tools and fixtures have been fitted, to turn these too over to the repair or parts manufacturing department and buy more new and special machinery for equipment for the coming season's cars. I am sure that you will all agree with me in this, as the laying aside of the old machines and buying of new will be good for the machine tool business. This, as you can see, would not be a hardship for the manufacturer of cars, if he buys the special machines and tools with the knowledge that he will more than save their cost in the season's run.

I imagine the question of the direct-connected, or motor-driven machines, is receiving considerable attention in your factories. It has always seemed to me that special machinery, or that adapted to doing one thing, was the ideal for a direct-connected tool, as the load will be fairly constant. It very often happens that a special tool will do so much work that it will be necessary to run it only part of the time. If motor-driven it could be shut down for the remaining part of the day without cost.

Group Plan Most Advantageous.

It does not seem practical to me to equip all standard machines with motors, as on a standard machine the work varies in style, quality and power necessary to accomplish the desired result, as at one time we might be using only one horsepower and at others 10 to 15, or whatever the capacity of the machine might be. For example, if we took a room of 20 milling machines and equipped them all with 7½-horsepower motors, the sum would be 150 horsepower, whereas very likely the whole room could be run to better advantage with one 50-horsepower motor, and we would have the difference in investment between the 20 7½-horsepower motors as against one 50-horsepower. It is a well-known fact, however, that the friction of the line shafts asd belts is greater than the power consumed by the required number of small motors running idle, or the amount of current used to run the motors themselves in excess of the load of the machine.

In the remodeling and moving around, which we have found necessary on account of the growth of our machine departments, we have been compelled to use motor-driven machines, as they could be placed in almost any position, and a great many times the room was not suitable for the hanging of shafting. I use the word "compelled" because I do not think anyone would lay out a machine shop for the special purpose of making automobile parts with the idea of using all motor-driven machines; or, in other words, not have a piece of shafting in the building.

Importance of Durability.

However, here is another instance where I would prefer a motor-driven machine: We will suppose, in order to get our output, we have to make 25 pieces of a certain kind in a day. Now, this operation, of whatever kind, uses a regular or standard machine, but the tooling is special, and, although it takes but two and one-half hours to perform the operation on the 25 pieces, on account of the difficulty in changing over the machine and the size of the piece, it is impractical to do more than that number per day. Now, although this is a standard machine, I should wish it motor driven as the power used to drive the countershaft, etc., with the wear and tear on belts for the remainder of the day, would more than offset the cost of the motor.

I may be mistaken, but I have always thought that the single pulley drive came as a natural result after the motor drive; not from necessity, but just because it was very easy to put a pulley on where the motor was connected.

There are a number of machine tools built, which, under certain conditions, can remove an enormous amount of stock, but the jobs are very few on which we can use a machine to the limit of its power. On the great majority of pieces that go to make up an automobile, if we held the piece tight enough to remove the material as fast as the machine will cut it, we would spring the piece all out of shape. If we do not spring it in chucking it will spring when we release it. I have very seldom

seen in actual use a cone-driven machine which would not do the work as fast as the piece or fixture would allow it to be done. As the single or geared machines must necessarily cost more money and the wear and tear on the whole machine is greater, I am inclined to believe that in a few years we will, most of us, be of the opinion that the single belt geared drive was not the success which we had expected.

It is not many years since the tool or steel man came around and told us that his steel would stand more than the machine was able to do, but I have not heard that remark passed in the last two or three years, which goes to show that the machines themselves have been perfected beyond the tooling point. It is all very well for a manufacturer to say that his machine will remove so may cubic inches of stock a minute, but in actual practice that does not interest us so much as to have the machine run 365 days in a year, if need be, without repair, and do one piece after another with perfect accuracy. As you see, I am not a very strong advocate of the single pulley drive over the old cone type.

Why Not Make Equipment Optional.

Automobiles do not seem to be getting much lower in price, but we are giving more horsepower for the same money. The tendency is toward larger bore and longer stroke engines, which mean larger and heavier parts throughout. This, of necessity, is reflected through the whole car. The requirements all along the line will be for heavier machine tools to take care of the increase in size and horsepower of the cars. We used to think that an engine with a 5-inch bore was large and mostly for racing purposes. In looking over a list of some of the American cars, I find there are 44 makes of cars using engines with 5-inch bore or larger, for the present or 1910 season, in standard touring cars, and I feel sure that there will be more next year.

I think you are building some fine milling machines. They are very powerful, and have all kinds of feeds, and quick-change gears for feeds, speeds, etc. Now these same machines are just like the universal milling machine, except that the table does not swing. As only a small part of the work done on a universal miller requires the moving of the swinging table, the machines are knee type and to all intents and purposes universal. As a rule, we use universal machines chiefly for tool work. The question I wish to raise is this: Do we need all these attachments and feeds in the same machine? Why not make them optional?

The same thing applies to lathes. We buy lathes with all kinds of quick-change appliances, feeds, stops, etc., but, do we really need them, or do we buy them because you force them on us against our will? We do, however, like the wide, heavy carriage, the large bearings, and rigid tail stock. A lathe used to be a simple machine; it was one of the first, if not the first, on which we started the apprentice to work.

Many Attachments Unnecessary.

Take a walk through most any automobile factory and notice the character of the work the men are now doing. Notice how often they use the change gears, etc., in getting out a large quantity of work. You are getting lathes to a point where they are almost universal in scope. I do not think we want a shop full of universal machines the greater part of the attachments on which will never be used. As it is now, it is like buying a universal grinder with all the attachments, extra spindles, etc., and putting into it work that should be done on the ordinary plain grinder. This would be the height of folly, for we would be getting no return whatever for our extra investment, and I am forced to look at some of the so-called standard machine tools which are being built at the present time in this light.

It is rather hard for us to expect the average man who cannot even read a micrometer to turn out accurate work on a complicated machine. We have been tied down to the old established precedent that every lathe called for a large and small face plate, steady rest, etc., but I think if we had lathes built that could be bought either with or without plain rest, compound rest, quick-change gears or screw-cutting attachments, and still have these attachments so they could be procured and put on at any time, it would save considerable money on our investment.

The Lathe Merely a Roughing Tool.

We finish very little work on a lathe now. No matter whether it is straight or taper, inside or outside, we invariably have a little to grind whether it is to be hardened or not. This makes the lathe only a roughing machine at the best, but it must be able to rough accurately and truly in order to leave a uniform amount to grind or finish.

The newer crank shaft turning lathes have proven very satisfactory. A number of us have tried grinding from the rough, but have given it up one after another. We may start off with drop forged cranks near enough to grind readily, but the dies wear and we have trouble, and eventually come back and rough-turn them on the lathe. I think it will be a fine thing when we can finish them in a grinder from the rough in an entirely satisfactory manner.

The manufacturers of plain grinders are moving in the right direction by making their machines heavier. High speed machinery must be heavy and stand firmly on the floor or foundation in order to be satisfactory. I do not think it pays to be saving with your iron in the designing of grinding machinery. The whole machine, bed, table, wheel carriage, etc., must be very heavy, enough so at least, that it will not synchronize with the vibration of the spindle, or the result will be poor work. We buy these machines and put them to work and no doubt they do not get the attention they should, but we expect them to do good, accurate work, although they may not be finely adjusted at all times.

Economies of the Grinder.

The same holds true in all classes of grinders, internal as well as external, and with the large milling cutters and tools we have to grind I think the tool and outer grinders might be made heavier without losing any of their efficiency. We are using water grinders in new ways more and more, and find they give the cheapest finish as well as the best and most accurate. This applies to soft parts as well as hardened ones. They save quite an item in float files and emery cloth. A large number of the different pieces that go to make up a first class automobile have operations on them in the grinding departments at some time before they are finished and ready for the stock room. We want in the future to finish more and more from the rough casting or forging without any previous or roughing operation. This applies to round as well as flat surfaces.

In the way of drilling and vertical boring machines we have used and shall continue to use still more multiple and special tools. While we now drill 10, 15 or 20 holes on one side of a piece, I see no reason why we should not be drilling as many more on the other side at the same time just

as we mill or turn a piece on two or three sides at the same time. These special and multiple drills make a very nice proposition for motor drive as the load is very uniform. High speed twist drills are used by almost everyone and all drilling and boring machines should be arranged accordingly.

An Opportunity.

We are using the gang drill press in successive operations to good advantage, and on large and long holes are getting a very cheap production, as one man can run a number of presses in one gang or set.

Strong and accurate interchangeable tools and fixtures that would be almost, if not quite, universal in scope, for holding the pieces to be machined, would be an added inducement to the purchase of the drills if they could be furnished in this way. The engine has had more special machinery built for it than any other part of the car, but the crank case, which carries it, seems to have been neglected except in the matter of multiple drills. I think there is a market for some horizontal boring and reaming machines with two or three spindles, having movable centers for boring out crank cases and transmission cases. On a crank case for an *L* motor we require two bars, and on a *T* motor case, three bars, for the crank shaft and cam shaft holes. As it is now we buy a horizontal drill and have to equip special driving heads to run these bars, and this also shortens the space on the bed of the machine. If such machines are made, I do not know of them and will say we are in the market for two or three right now.

Improved Screw Machines Wanted.

On the automatic screw machine we want greater production combined with accuracy. We also want machines which require the minimum of repairs. In the hand screw machines we are looking for new and original ideas for holding and tooling the pieces for chuck work and second operation. Some of the large bar machines are going to prove to us they can make gear blanks cheaper from the bar than from the forging. The turret machine builders have the right idea in enabling us to buy the bare machine or with as many outfits or tools as we require.

Regarding gear cutters, I do not think of anything other than what I have said in a general way. I do think, however, that some one should get up a machine or attachment for grinding rotary gear cutters and hobbs after they are hardened so that they will be absolutely correct. It might make the cutters more expensive, but with the increased wear we get from high-speed steel, they would be well worth the money.

Just a word or two about special machinery. As I have already told you, I am in favor of special machinery for doing one thing, and that well and quickly. I will give you only two or three examples which perhaps you will not think of. We are all using square holes more or less in our transmission gears. There should be a good sale for a machine to work out a round hole into a square one, within a reasonably close limit. This could be done either vertically or horizontally, and does not seem to me to be a very difficult operation. We would be willing to run a sizing broach through if it were necessary, but when we have to broach out a long sliding gear hub made from high grade alloy steel it is a long and seemingly unnecessary operation.

Tools Needed for Special Operations.

There are an enormous number of cotter pin holes to be drilled in the ends of bolts and studs. I do not see why we should not put them into a hopper and have them come out all drilled automatically.

The same is true of castellated nuts. I do not see why these should not be slotted by an automatic machine as well as threaded.

Then we have the square shafts that fit in the same square holes referred to. These should be ground with a form or master doing the flats and corners all in one operation, in the same manner in which we are now grinding the cam shafts. After machines of this character have been perfected, I do not see why they should not be standardized and sold as such.

After having done a nice charitable piece of work and sold an automobile manufacturer a lot of machines, either a large or small order, if you wish to make that manufacturer your friend for life, you should offer to tool the machines up complete with fixtures, etc., for holding and performing the different operations which he requires.

One of our superintendents was somewhat opposed to a certain make of machine, but after the manufacturer came right to the factory and took the blue prints of the parts to be made away with him and sent in the machines all tooled up ready to start at work and all the tools fitted and tried out for future operations on the same pieces, when we wanted any more machines of that kind we did not have to ask that superintendent what make of machine he wanted, for he never wanted any other.

With our tool room capacity taxed to the utmost, both as to men and machines, to keep up with the wear and tear on machinery and tools, I do not think you begin to appreciate what it means to us to have the machines come in ready to belt or connect and do business. The building of tools for the new models always comes right in the height of the manufacturing season of the older models when we can least spare our tool room force.

In closing I would like to suggest one point; some of you may be carrying it now, but if you are, I am not aware of it.

Give the Designer a Chance.

A number of the tool builders, I do not know how large a proportion, when they sell a machine, or a number of them, send out a demonstrator, or a man to instruct the manufacturer how to use it properly to obtain the best results. Some of you keep men on the road all the time, going from place to place to see that your machines are used as they should be. Are any of you sending your designers around to see what they can learn from the actual conditions existing in automobile factories? If not, why not? Let them visit and talk with the heads of the departments, the general foremen and superintendents of a number of the large automobile factories where your machine tools are used. You will then find out whether your machine is the best that you can make it for the work or not. Also whether you could not make it cheaper and have it answer the purpose just as well. If you will do this you will find out more about what is required than you ever can by getting some one like myself to tell you how little he knows about machine tools.

Lectures for Business Men.—Paul Blatchford, local secretary of the National Metal Trades Association, George L. Wilson, of the Cortiz-Wilson Mfg. Co. and Charles A. Hanson, all of Chicago, were in Milwaukee recently making arrangements for a course of lectures to be given either in the Auditorium or Pabst Theater for business men. The speakers under consideration are: Charles W. Eliot, former president of Harvard; Senator Beveridge of Indiana, Jacob Reis, James J. Hill, former Governor Joseph W. Folk and others.

SPRING MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

A Very Successful Convention and Many Valuable Papers Presented.

The professional sessions of the spring meeting of the American Society of Mechanical Engineers at Atlantic City opened at 10 a. m., Wednesday, June 1.

Secretary Rice read the report of the tellers, showing the election of nearly two hundred members to the society. Announcement was also made that the amendments to the constitution, C-10, C-11 and C-45, relating to memberships and standing committees, had been carried.

Chas. Whiting Baker referred to the steps taken toward legislation looking to the licensing of civil engineers, a bill having been introduced at the last session of the New York legislature with that end in view. Mr. Baker explained that the bill required engineers to pass an examination before a state board of examiners to be appointed by the board of regents and to pay a license fee of $25 for the privilege of practicing their profession. Owing to the representations of prominent engineers, however, to the committee to which the bill was referred, it was withdrawn with the understanding that it would be amended and re-offered later. It was also stated that the ultimate purpose of the bill was to extend the authority of the board to all branches of engineering. The president was authorized to appoint a committee to confer with other engineering and technical societies with a view of taking such steps as might appear to be advisable to protect the interests of the engineering profession as a whole from unwise and injurious legislation, and the president invited suggestions from the society by letter as to the composition of the committee.

The first professional paper presented was on "The Shockless Jarring Machine," by Wilfred Lewis, of the Tabor Mfg. Co., Philadelphia. This machine was described and illustrated fully in THE IRON TRADE REVIEW of January 20, 1910. The author pointed out that the development of machine molding has been limited in the past to machines of comparatively small capacities, but the author believes that the greatest development and the largest savings are to be anticipated in large work quite beyond the capacities of machines hitherto considered practicable. The paper deals with the key to this development, the shockless jarring machine, a new type of jarring machine in which the shock heretofore transmitted to the ground is absorbed as effective work by the machine itself. This machine saves substantially all of the ramming time, and, in combination with others, saves pattern drawing and finishing time and opens the way to economies in the foundry of startling magnitude. Other labor-saving appliances may be employed still further to reduce the molding time on any given piece of work.

The principles governing the design of a jarring machine include solidity of construction and freedom from vibration in the jarring table, no shock of impact on foundation, convenient control, accessibility to all working parts and economy of power. Solidity of construction is the most important and economy of power the least important consideration. The jarring process is quick and effective, but seldom economical in the consumption of power. Efficiency depends chiefly upon the weight of anvil used, and to some extent upon the length of stroke, the expansive use of air, clearances, and character of sand. The shockless anvil is more efficient than the same anvil cushioned on a wooden crib, and when equal in weight to the loaded table it is twice as effective.

The shockless jarring machine requires no foundation beyond that necessary to sustain the static load, and for this reason it is well adapted for use on the upper floors of buildings, where many foundries are now being located.

Discussion.

A. E. OUTERBRIDGE:—The shockless jarring machine marks a distinct and important step in advance in the already remarkable development of molding machines in recent years. The value of this improvement will become more and more apparent with the increase in size and capacity of the machine, because the jarring principle is undoubtedly the method par excellence for large work.

The chief objection heretofore has been caused by ground waves due to shock. Granted that this trouble may now be eliminated, without loss of ramming power and proper flow of sand, by means of the floating anvil, there is apparently almost no limit to the future development of the molding machine. Even today, quite large and important castings are being successfully made on jarring machines, that a few years ago would have been considered entirely beyond the capacity of any molding machine.

In the foundry of Wm. Sellers & Co., with which the writer is connected, a jarring machine made by the Tabor Molding Machine Co., negotiates flasks 80 inches by 70 inches by 40 inches deep in the drag and 16 inches deep in the cope. The live heads for several large and powerful lathes have been made on this machine in this flask, which contained 120 cubic feet of sand, the weight of the sand and flask being 16,800 pounds. The weight of the casting is about 9,000 pounds. Machine uprights have also been made on this machine in flasks 140 inches by 50 inches by 38 inches deep in the drag and 16 inches deep in the cope, containing 129 cubic feet of sand; the sand and flask together weigh 20,640 pounds. These castings, being of comparatively thin section, weigh about 4,500 pounds each.

Apart from the reduction in cost of molding these large castings on the jarring machine, there is a great advantage in the more uniform weight of duplicate castings and in the more uniform distribution of the sand, the absence of "spongy spots" and "hard parts" inseparable from hand ramming, tending to insure good castings.

The chief, if not the only objection, to the operation of this machine in the foundry is the "earthquake" tending to cause sand to drop in contiguous molds in the floor, and in order to overcome this, arrangements are now being made to adapt the shockless principle to the jarring machine already installed. When this has been accomplished, it is believed that green sand molds with large overhanging portions can be safely made in the floor alongside of the shockless jarring machine.

The writer was present at a test recently made at the works of the Tabor Machine Co. of a combination shockless roll-over jarring machine erected temporarily on the third floor of an old building, and saw the machine ram up a half mold 23 inches by 32 inches by 13 inches deep, weighing about 1,000 pounds, without perceptible shock and with no more pulsation in the floor than might be expected from the operation of a power squeezer.

E. H. MUMFORD:—Mr. Lewis treats the compacting of sand by jolt-ramming machines as occurring uniformly and simultaneously throughout the mass. Last October, before the Philadelphia Foun-

drymen's Association, I called attention to the fact that a zone of proper mold density rises gradually from approximately horizontal joint and pattern surfaces until it nearly reaches the top. Practically as well as theoretically it never does reach the actual top in the time in which the rest of the mold becomes hard enough; and the extreme upper layer must be hand-rammed unless excess sand is used and struck off, in which case the unrammed upper layer is in this excess.

Were this not true, the many experiments which have been made in ramming molds by dropping sand in cartridges would have borne fruit.

Mr. Lewis gives the reason for this behavior of the sand in his statement "the greater the change in velocity at the moment of impact the greater the ramming effect." Now, in all the upper regions of the mold, where the sand has considerable depth, the rate of "change in velocity at the instant of impact" is practically nil, nor does it become considerable until the sand below has been brought to a density sufficient to effectively transmit the impact on the anvil to the sand above.

For this reason, I believe, and have so stated, that the jolt ramming of sand is a progressive process in which the first impact rams the sand next the rigid horizontal planes to the maximum density possible for the machine, matchboard and patterns used, the next impact affecting the sand immediately above through the medium of the sand already rammed and so on to the top of the mold in gradually diminishing density. In other words, the inequality of the density of the sand at bottom and top of the mold, practically infinite at the first impact, diminishes as the zone of hard sand rises toward the top.

This analysis, I believe, is the only one which can follow the law which Mr. Lewis states in the above quotation in which he uses the expression "the change in velocity at the instant of impact." I think Mr. Lewis will agree with me that no change in the velocity of a body at the instant of impact is finitely possible, and that what he intended to say was "the rate of change in velocity at the instant of impact."

F. W. Taylor:—The worst feature of the jarring machines as they now exist, is that in many cases after they have jarred the sand down, they set up a vibration in the mold itself, which shakes a part of the sand loose from the mold, and thus makes a crack or lamination in the mold, which in many cases spoils, and in many other cases injures, the mold. That jar, and that lamination in the sand, is often brought about by the vibration of the upper part of the upper table of the jarring machine, which gives the mold a little jump off the table, after it strikes and breaks down the sand. Mr. Lewis' construction is of the very best type to resist that upper vibration of the table and Mr. Mumford's is not.

I think the most impressive feature of Mr. Lewis' paper is the remarkable figures which he sets forth here as to the gain to be made by combining in one machine several separate improvements, each of which is on a separate machine. It seems almost inconceivable, when one looks at it the first time, to say that three improvements, each one put on a separate machine, should only result in turning out 1.7 as much work as could be done by the hand process, while by the combining of these same three elements, it is possible to do sixteen times as much work. I think that is an entirely new idea, and one which deserves the greatest attention. I have not the slightest doubt that Mr. Lewis is correct in that matter, although it seems to be almost inconceivable.

There is another feature of Mr. Lewis' machine, which I do not think has been dwelt upon sufficiently, and that is the spiral spring just below the table, which has two valuable uses. In the first place, it enables the use of a massive table, which minimizes the vibration set up in the mold, and at the same time maintain efficiency in the machine, because a part of the weight of this table is stored in this spring, and all the weight stored in the spring in its downward passage is given back when it rises, and thereby the dead effect of a heavy falling table, so far as efficiency is concerned, it eliminated by the spring. There is a second effect of the spring which is also useful in a jarring machine, and I am not sure but that it is the more useful of the two. If you have two bodies, one placed on top of the other, the full weight of the upper body, when they are at rest, is borne by the lower body. If you free those two lower body. If you free those two bodies, and allow them to fall, the pressure between the upper and lower body at once becomes zero.

Now, molds are almost always loose and flimsy in their character; that is, the wet sand adhering to the mold and the mold not fitting closely to the table, and when they are raised, the pressure of the mold on the table distorts the mold to a certain extent and it springs, and tends to adjust itself somewhat to the table. If the table and mold then start downward together, the pressure is released, and the mold instantly springs up, and when you strike bottom, the mold distorts again and sets up a vibration in the mold itself which jars the sand loose. This spring of Mr. Lewis' serves the valuable purpose of maintaining an additional pressure between the table and the mold. It retards the fall and diminishes the gravity effect on the table, while the pressure of the mold remains constant. It does not affect the joint between the two and diminishes the distorting effect on the mold as it comes up.

A Paper on Machine Tool Design.

The second paper was on "A Comparison of Lathe Headstock Characteristics," by Prof. Walter Rautenstrauch. The paper is concerned with the determination of the adaptability of a number of engine lathes to the economic performance of a standard task. The method of comparison is that devised by Dr. J. T. Nicolson and Dempster Smith, of Manchester, England, and consists in determining the extent to which each speed-torque combination possible in a given lathe lends itself to removing the greatest weight of shavings in a given time from a given diameter of work. The standard task assigned to each lathe is taking a predetermined area of cut on all diameters of work of mild and soft steel pieces, with high-heat steels. The results of the comparison are not intended to justify or condemn a lathe for general purpose work, but are intended to show the attempts of different manufacturers to meet the conditions favorable to the use of the high-heat steels. They show, among other things, that a more rational means of spacing speed-torque combinations is needed. Many of the lathes examined are shown to have a number of speed-torque combinations which may be dispensed with as far as their adaptability to more economic weight removal is concerned, no matter what the standard of comparison may be.

Discussion.

The paper was discussed by Carl G. Barth, F. W. Taylor, Oberlin Smith and John Fritz. Mr. Barth spoke of his long connection with the operation of machine tools and showed by means of several diagrams and the application of certain formulae, which he had devised, that the means are at hand to accomplish the ends set forth in the paper. F. W. Taylor touched briefly upon his experiences with machine tools, particularly in connection with his work at the Bethlehem Steel Co., which led to the development of the modern high-speed steel and to consequent radical changes in machine tool design. Speaking of the tools at the Bethlehem Steel Co., he said that those designed by John Fritz, and which were chiefly remarkable for what he designated as "brutality" in design, were the only ones which stood up under the severe tests applied.

Oberlin Smith said that the thanks of

the society were due to Mr. Taylor for the coining of a new adjective in connection with machine tool design and expressed the hope that machine tool design would be characterized by more pronounced "brutality" in the future, adding that, in his judgment, it was impossible to get too much iron into the stationary or slow-moving parts of machine tools. Those familiar with the history and development of machine tools will readily recognize this doctrine as familiar, though machine tool builders have, probably because of competition, gone rather to the other extreme.

The third paper on "Strength of Punch and Riveter Frames Made of Cast Iron," by Prof. A. L. Jenkins, of Cincinnati, was published in full in THE IRON TRADE REVIEW of June 2, and was discussed by James Christy, Prof. Rautenstrauch, Frank J. Ellis, John S. Meyers and S. A. Moss.

Improvements in Stay-Bolts.

The concluding paper of the session was on "An Improved Method of Finishing Stay Bolts and Straight and Taper Bolts Used in Locomotives," by C. K. Lassiter, Richmond, Va. The paper shows the method of finishing stay-bolts (in particular the water-space stays), the advantages of reducing in the center and how this may be done automatically during the threading operations, the automatic drilling of tell-tale holes in these stay-bolts, and the advantages over other methods, such as drilling when in place.

The turning and facing under the head of straight and taper bolts are also treated, with a general description of the tools and equipment used, and a table illustrating the system of reaming the holes to standard sizes and taking bolts from stock, making repair work not only new construction, but practically a manufacturing proposition.

The author refers to the improvement in quality as well as production cost which results from the automatic threading of the bolts during the turning operation, and gives a comparison of costs of the different operations. The paper was discussed by Col. E. D. Meier, of the Heine Safety Boiler Co., New York City.

No session was scheduled for Wednesday afternoon, the time being left free for members to employ as most agreeable. Tickets to various places of amusement and for rolling chairs on the board walk were provided by the committee in charge.

The Thursday morning session was devoted to the Gas Power Section, J. R. Bibbins presiding.

A New Gas Engine.

The first paper, on "A Regenerator Cycle for Gas Engines Using Sub-Adiabatic Expansion," was read by the author, Prof. A. J. Frith, of Chicago.

A new cycle, of theoretically 100 per cent efficiency, caused by the expansion line being steeper than that caused by free expansion, is presented in this paper, which shows that in the older regenerative cycles the loss of heat to water cooling overbalances the theoretical economy, which is here avoided. How the brake efficiency, under practical conditions, may be derived from formula and a heat expenditure of 7,000 B. T. U. may be expected with a compression pressure of only 125 pounds by the gage, and a peak pressure of 275 pounds gage are also described.

This means 50 per cent greater economy in fuel than is usual, say, with illuminating gas. A chart showing the variations of regenerator efficiency with size, indicates that only practical conditions and temperatures are required to carry out the cycle. A design is shown in which no scavenging is required, no mixtures are made and spontaneous ignition appears. While the danger of preignition is avoided, the conditions for perfect combustion are coupled with light pressure and ordinary good workmanship. The paper was discussed briefly by S. A. Moss, Prof. Wm. T. Magruder and Chas. Whiting Baker.

Multi-Cylinder Gas Engines.

The second paper, on "Gas Engines for Driving Alternating Current Electric Generators," by H. G. Reist, Schenectady, N. Y., points out briefly the problems which must be solved to obtain best parallel operation of alternating-current generators when driven by means of gas engines. While some assistance can be given in designing the generator, the most satisfactory solution of the problem is so to design the gas engine that as nearly even rotation as possible is obtained. This should be done without the use of a very heavy flywheel.

There was no discussion.

New Terms for Power Measurement.

The third paper, on "Two Proposed Units of Power," by Prof. Wm. T. Magruder, of Columbus, O., gives the history of the terms "horsepower," "commercial horsepower," "Centennial horsepower," "unit of commercial evaporation," "unit of evaporation," "kal," "boiler horsepower," and shows how they have been changing in definition and value, with a comparison of the values in B. T. U. of the units of evaporation and of boiler horsepower. An objection is made to the use of the term horsepower as applied to steam boilers, since as the output of a steam boiler is heat energy, it should be so measured. The capacity of power of a boiler and its output of energy should, therefore, be measured in "boiler-powers." A boiler-power is defined as 33,000 B. T. U. of heat energy delivered per hour by a steam boiler, steam main or hot-water heating main, or the like, or added per hour to the feed-water of a boiler, or to the water of a hot-water heating system.

Similarly, an objection is raised to the term "horsepower" as the unit of measurement of the output of heat energy of a blast furnace, coke oven, gas producer, gas main or an oil well. The statement is made that 10,000 B. T. U. of heat energy are required per hour as the average of the best gas engine practice today for the development of a mechanical horsepower. It is proposed that the heat energies of gaseous and liquid fuels be measured in "gas-power," a gas-power being defined as 100,000 B. T. U. of heat energy delivered per hour by a gaseous or liquid fuel.

The paper was discussed by Prof. Wm. Kent, H. G. Stott, John C. Parker and E. D. Dreyfus. Mr. Stott made the suggestion that the proposed new unit of power measurement should be called a "Thurston" in commemoration of the late Prof. R. H. Thurston.

A Paper Worthy of Note.

The fourth and last paper of the session "Operating Experience with a Blast Furnace Gas Power Plant," by H. J. Freyn, South Chicago, was by long odds the most important paper presented to the convention and in many respects one of the most notable papers presented at any meeting, conveying as it does a vast amount of data concerning the operation of a large gas power plant, and of a nature which has been hitherto sought unavailingly by engineers at large. The plant under discussion in the paper consists of four 2,000-kilowatt gas engine generators receiving blast furnace gas cleaned in a preliminary and secondary washing plant. The former consists of two tangential dry dust catchers and two wet scrubbers, or hurdle washers, while in the latter Theisen gas washers are used. The gas is supplied by six blast furnaces, and had in 1909 an average heat value of 98.3 B. T. U. per cubic foot and contained 26.51 per cent CO, 3.57 per cent H, and 0.196 per cent CH_4. The temperature of the gas entering the gas cleaning plant averages 332.5 degrees Fahr., which was reduced during the cleaning process practically to atmospheric temperature at the engines. The average raw gas pressure was 9.29 inches of water, while gas of 4-inch pressure is delivered by a 100,000-cubic foot gas holder. The average amount of flue dust in the dry cleaned gas was 1.53 grains per cubic foot, which during the washing process was reduced to 0.0058 grains per cubic foot. The wet scrubbers

took out 80 per cent and the secondary cleaning plant 98 per cent of the amount of dust received. The total efficiency of the gas washing plant was 99.5 per cent. The amount of moisture in the engine gas averaged 5.62 grains, against 3.49 grains in the atmospheric air. The amount of water used for gas cleaning averaged 102 gallons per 1,000 cubic feet of gas cleaned, 83 gallons of which were used in the wet scrubbers and 19 gallons in the Theisen washers. The power consumed in the gas cleaning plant was 3.3 per cent of the gas engine output. The load factor for the year was 72 per cent and the average running time was 77 per cent of the total possible time. The thermal efficiency at shaft of the plant, as determined continuously by venturi meter, averaged 20.8 per cent for 1909. The total output of the station was 50,494,100 kilowatt.

THE IRON TRADE REVIEW hopes to reprint the paper, together with the discussion thereon, in full, later.

A New Field of Opportunity.

At the Thursday afternoon session, the first paper presented was on "The Mechanical Engineer and the Textile Industry," by H. L. Gantt, of New York, pointing out that the subject of industrial engineering has of recent years begun to attract the attention of the mechanical engineer, and the object of this paper is to call his attention to a portion of this field—the processes of a bleaching plant—that so far has had but little attention from him, and in which there are great possibilities.

In the past, the most important work of the mechanical engineer has been in the line of steam engineering, and the progress he is still making in that line, in spite of the high efficiency to which the prime movers have been brought, is a testimony to his success. There was no discussion on this paper.

Some Characteristics of Bronzes.

The second paper, on "The Elastic Limit of Manganese and Other Bronzes," by J. A. Capp, of Schenectady, N. Y., shows that at a stress but little above the elastic limit, or limit of proportionality, of stress to strain, mild and medium steels show a characteristically sudden breakdown, such that during an appreciable interval the specimen stretches without increase of load. This point, called the "yield point," is marked by a jog in the autographic elastic curve, and is indicated by the dropping of the beam of the testing machine and by the slipping of the points of dividers held in bench marks on the specimen. The paper deals with the elastic curves of brass and bronzes, which show no such break or jog, but, characteristically, are smooth curves, substantially straight at first and gradually bending over at an increasing rate as stress increases. Hence the locating of a so-called yield point, in testing bronzes or brasses by commercial methods, is entirely a matter of the judgment of the operator, and the point reported bears no definite relation to the elastic limit or limit of proportionality, as indicated by the elastic curve. The paper was discussed by President Westinghouse, F. W. Dean, Frank B. Gilbreth and E. A. Uehling.

A Suggestion in Pipe Design.

The third paper was on "The Hydrostatic Chord," by R. D. Johnson, of Niagara Falls, N. Y. The term "Hydrostatic Chord" is one applied to a novel shape for large pressure conduits. It is particularly applicable only to very large pipes working under comparatively low pressure head and lying in a shallow trench. Its function is to produce a tendency in the pipe to round out after the pressure reaches a certain mean value, which causes an effort to increase the vertical diameter, thus tending to lift both the dead weight of the pipe shell itself and the top fill. In a circular shape no such tendency exists, and all the deforming forces add together to produce severe bending moments, which are aggravated by the direct tension due to the water pressure. With a shape properly designed on correct hydrostatic principles the bending moments may be made to offset each other in such a way that nearly pure tension may be brought about at some assumed maximum operating pressure. The paper was discussed by Chas. Whiting Baker.

Some Figures on Train Resistance.

The closing paper of the session was on "The Resistance of Freight Trains," by Prof. E. C. Schmidt, of Urbana, Ill., and deals with the results of tests made upon the Illinois Central railroad by the railway engineering department of the University of Illinois to determine the resistance of freight trains.

The relation between train resistance is defined in pounds per ton and speed in miles per hour, and expressed for trains of various average weights per car, the marked influence of car weight being indicated by the following facts:

At a speed of 5 miles per hour, the resistance of a train in which the cars average 75 tons in gross weight is 3 pounds per ton, whereas for a train whose average car weight is 15 tons the resistance is 7½ pounds per ton, a difference of 150 per cent. At higher speeds the relation between resistance values is about the same as at low speeds. At 40 miles per hour, for example, the resistance of a train of 75 tons average weight per car is 5½ pounds per ton, while for a train of 15 tons average weight per car is 13½ pounds per ton.

The trains tested vary in weight up to 3,000 tons. The tests were made over main-line track of good construction, laid with 85-pound rail, during weather when the temperature was above 30 degrees Fahr. and when the wind velocity did not exceed 20 miles per hour. The test data are displayed in the paper and the results fully discussed. The discussion was spirited and was participated in by S. A. Moss, F. W. Dean, H. G. Stott, G. N. Van der Hoef, H. R. Cobleigh, W. H. Bryan, Chas. Whiting Baker, F. S. Bailey, Prof. Wm. G. Raymond, F. J. Cole, Prof. W. F. M. Goss and J. B. Blood.

Admiral Melville Honored.

On Thursday evening, honorary membership in the society was conferred upon Rear-Admiral Geo. W. Melville, U. S. Navy, retired, followed by an address by Admiral Melville on "The Engineer's Duty as a Citizen." Sir Wm. White, late chief constructor of the British navy, followed with a short address eulogistic of Admiral Melville. The addresses were followed by a reception and dancing.

Line Shaft Economies.

The Friday morning session opened with a paper of particular excellence, "Ball-Bearing Line Shaft Hangers," by Henry Hess, of Philadelphia, and which is printed in full elsewhere. Messrs. F. B. Gilbreth, H. J. Smith, F. W. Dean, J. Sellers Bancroft, G. N. Van der Hoef and C. J. Jackson participated in the discussion, of which a digest will be given in the next issue of THE IRON TRADE REVIEW.

The Strength of Clutches.

The next paper, on "An Experimental Analysis of a Friction Clutch Coupling," by Prof. Wm. T. Magruder, Columbus, O., gives the results of five lines of investigation: *a*, on a dynamic clutch-testing machine; *b*, on a static apparatus, using 24-inch four-jaw friction clutch couplings from stock.

The solid clutch broke at 200 horsepower at 100 revolutions per minute when load was gradually applied, and at 110 horsepower at 100 revolutions per minute for a pick-up load; the split clutch broke at 140 horsepower at 100 revolutions per minute, with load gradually applied. A maximum axial thrust on the collar of 600 pounds may be required, or 115 pounds at the end of a one-to-five shifter lever, creating a total pressure of 8,000 pounds by the shoes on the ring, or 50 pounds per square inch. The paper was discussed by Messrs. H. J. Smith, G. N. Van der

Hoef and Oberlin Smith. H. J. Smith's discussion was illustrated by lantern slides.

The Measurement of Power.

The third paper, on "An Improved Absorption Dynamometer," by Prof. C. M. Garland, Urbana, Ill., describes a type of eddy-current dynamometer adapted for the absorption of power given out by motors under test, with an enumeration of the conditions that an absorption dynamometer should fulfill, illustrating the advantage of this machine.

The dynamometer consists of a copper disc revolving between the poles of an electro-magnet. The power absorbed is utilized in the generation of eddy currents in the disc, which short-circuit among themselves and produce heat, which is carried off by circulating water. The change in load is effected by a rheostat in series with the exciting coil. Attention is drawn to the flexibility of the design and the adaptability of the machine to both large and small powers. The paper was discussed by Prof. Allen.

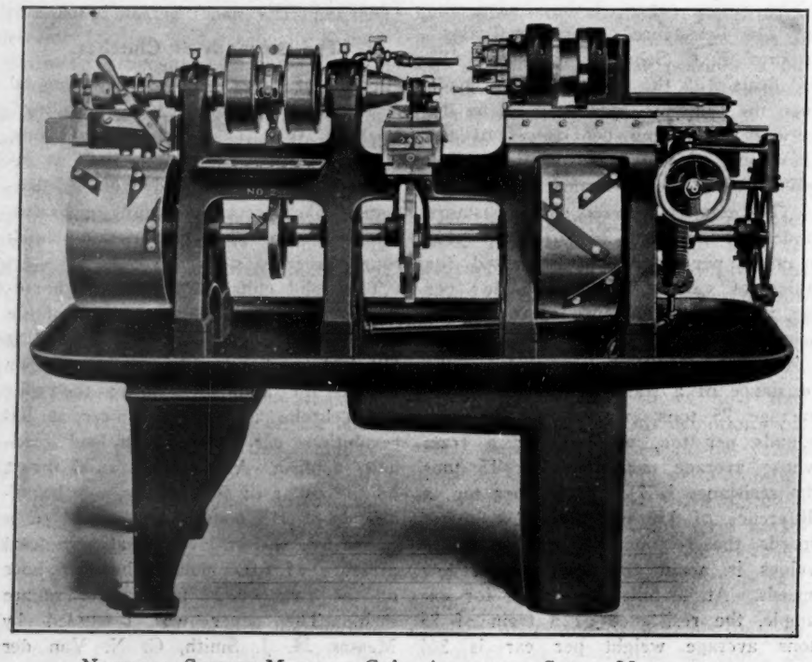
A Complex Question.

The fourth and concluding paper of the session and the last of the meeting, on "Critical Speed Calculation," by S. H. Weaver, Schenectady, N. Y., treats the motion of a rotating shaft mathematically as vibrations along two axes at right angles to each other. Properties of the equations of vibration are discussed and curves given, showing the amplitude of vibrations at different speeds for various shaft loadings, spans and bearing supports. For the points of maximum vibration, the general formulae are reduced to special forms and given in a reference table for convenient use. The paper was discussed briefly by S. A. Moss and Henry Hess, after which the convention adjourned.

IMPROVED AUTOMATIC SCREW MACHINE.

The National Sewing Machine Co., Belvidere, Ill., has designed and built the new automatic screw machine, illustrated herewith and for which is claimed distinctive features in general construction, simplicity of operation, reduced maintenance expense, facility and simplicity of cam changing and ready adjustment to the various classes of work for which the machine is adapted.

The feeding of the rod through the tube is effected by a positive cam movement, feeding the stock to exact length. The spindle is driven by two belts, for forward and return movement respectively, operated by a quick friction clutch, claimed to be positive in its reverse action, insuring uniform length of thread in threading operations and in quick time. The feed is driven by a positive clutch and planetary gear system, giving any speed instantaneously from 1 to 48. The axis of the turret is horizontal and the lock bolt is outside the tools, which insures rigid locking. The machine is stated to be capable of milling to a greater length than any other. The cross slide is independently operated to a stop. The machines are built in turret and plain styles, the latter designed for the use of taper pin attachments, thread rolling, knurling, side drilling, slotting and second operation magazine work. The illustration shows the No. 2 turret machine, which has a chuck capacity of 5/8-inch, a milling length of 3¾ inches, and feed-out of 7¼ inches. The turret has four holes and the floor space required is 3 feet by 4 feet 9 inches.



National Sewing Machine Co.'s Automatic Screw Machine.

PARAGRAPHS.

The Peerless Voting Machine Co., Lawrenceville, Ill., whose incorporation with a capital stock of $100,000 was recently noted, has organized with the election of the following officers: President, P. G. Bradbury; secretary, S. J. Maxwell, both of Robinson, Ill., and general business agent, A. L. Maxwell. The company plans to have its voting machine built by contract in Chicago, at least for the present.

Risdon Iron & Locomotive Works, San Francisco, is engaged in revising its catalog file and announces that it will be glad to receive catalogs from manufacturers of accessories allied with mining, milling, hydraulic and mechanical engineering lines.

No. 1 furnace of the Warwick Iron & Steel Co., Pottstown, Pa., was blown out May 24 for relining and other repairs. It had been blowing for two years.

NEW CATALOGS.

THREADING TOOLS.—The Landis Tool Co., Waynesboro, Pa., has issued a 48-page, 6 x 9-inch catalog describing its line of single, triple head bolt cutting and threading tools, all of which are equipped with the Landis die. These dies never require to be re-hobbed, nor, consequently, annealing and re-tempering, and the same dies will cut either right- or left-hand threads by using opposite ends.

POWER PLANT APPLIANCES. — The Sims Co., Erie, Pa., has issued, in sectional form, a number of bulletins descriptive of its power plant appliances, of which bulletin TH 2 describes the Sims hot water generators and converters; LH 2 the Sims tube heater for heating water in large quantities; OH 2 describes the Sims open-feed water heater and purifier; SS 2 the Sims steam separator, of vertical and horizontal types; and M 2 the Sims exhaust heads, oil extractors, oil filters and low water alarm.

LATHES.—A handsomely gotten-up 112-page, 6 x 9-inch catalog has come from Lodge & Shipley, Cincinnati, O., descriptive of their line of engine lathes, and turret chucking lathes, both in cone and patent head types, and for either belt or motor drive. The introduction is a quotation from The Iron Trade Review on the subject of high speed steel, and emphasis is laid upon the fact that the company concentrates its entire effort on the manufacture of lathes only.

MOTOR STREET CARS.—Bulletin No. 4730, by the General Electric Co., Schenectady, N. Y., describes a gas-electric motor street car, of which the equipment consists of a direct coupled combustion engine and generator and standard motor.

GEARS.—Catalog E-3 of the Boston Gear Works, Norfolk Downs, Mass., is of pocket size, 3½ x 6-inch, 94 pages, and describes an almost endless line of spur, bevel, miter and helical cut gears, racks, worms and worm gears, ratchets, etc., together with much information useful in gear calculations.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing concerns have filed articles of incorporation:

Lakeside Laundry Co., Seattle; $20,000; to manufacture laundry machines; by F. C. Kilbourne.

The Rotary Valve Co., Detroit; $100,000; by C. D. Hastings, W. D. Ducharme, E. A. Nelson, and J. W. Patterson.

The American Oil Burner & Mfg. Co., Seattle; $2,000,000; by Leslie Collingwood, Harry Taylor, J. Davis and M. Taylor.

The Automatic Arms Co., Buffalo, N. Y.; fire arms, ammunition, etc.; $100,000; by George R. Klahs, Fred W. Ely, and James McAlpine, Buffalo, N. Y., and three others.

The Utica Cutlery Co., Utica, N. Y.; cutlery, razors, tools, etc. $50,000; by Carl W. Tillmanus, August Kemper, both of Camillus, Jacob Agne, 427 Concrete street, Utica, N. Y.

The Atlas Water Tube Co., Camden, N. J.; water tube boilers; $200,000; by Philip J. Dougherty, J. Borden Retten, and John Quincy Adams.

The Rock Island Pulverizer Co., Rock Island, Ill.; $100,000; by Robert Forsythe, Wallace W. Wiegand and W. G. Xander; mining and milling machinery.

The O. O. Poorman Co., New Bremen, O.; $30,000; sheet metal machinery; by O. O. Poorman, Edward M. Ziegenfelder, Leonora O. Ziegenfelder, O. M. Gotschall and E. H. Turner.

The Dyett Tool & Engineering Co., Ilion, N. Y.; tools, engines, boilers, machinery, etc.; $100,000; by Frank J. Dyett, Bert B. Ross, Albert J. Johnson, Ilion, N. Y., and four others.

McMann & Taylor Co., New York City; iron pipe, boiler tubes, radiators, valves, etc., $400,000; by George W. K. Taylor, James R. McMann, George E. Buford, 103 John street, New York City.

The Altoona Zinc Works; New York City; $10,000; to mine and refine zinc ores, etc.; by William A. Cooner, Frank A. Spencer, both of 64 Wall street, and James A. Nelson, 60 Wall street, all of New York City.

Hochman's Sons Iron Works, Brooklyn, N. Y.; iron ware, gratings, beams, etc.; $2,000; by Solomon Hochman, 68 McKibben street; Julia Hochman, 65 McKibben street; Louis Hochman, 68 McKibben street, all of Brooklyn, N. Y.

The Motor Machine Co., Terre Haute, Ind.; $1,200; by David R. Ulmer, Michael Henry, and James M. Colwell.

The Jewell Steel & Malleable Co., Buffalo, N. Y.; to manufacture and deal in articles of steel, iron, copper, etc., $50,000; by Walter E. Jewell, North Tonawanda, N. Y.; Allen W. Valentine, and Bessie Knox, Buffalo, N. Y.

The Mechanical Appliances & Power Co., New York City; to manufacture, purchase and deal in railway cars, railway appliances, automobiles, motor boats and engines; by John C. Renter, Bryan A. Eldred, and Frank G. Silver, all of New York; $300,000.

The Uraniumite Co. of America, Buffalo, N. Y.; $400,000; metals and alloys, etc.; by William L. Bechtols, 252 Connecticut street, Buffalo; Horace C. Mather, Hamburg, N. Y.; and Harry E. Nichols, 377 Elmwood avenue, Buffalo.

The Universal Standard Electric Co., Brooklyn, N. Y.; manufacture and deal in electrical machinery and appliances; $50,000; by James J. Nevins, 115 Hawthorne street; W. H. Hobart, 285 Cornelia street; Arthur Schreiner, 424 Cornelia street, all of Brooklyn, N. Y., and two others.

New Construction:—

The Globe Malleable Iron Co., Syracuse, N. Y., has taken out a building permit for steel forge shop, estimated to cost $12,000.

The United States Lock Co., Clinton, Ia., has let a contract for an addition to its plant, two stories, 24 x 199 feet.

Crane Co., Chicago, has taken out a permit to build a four-story brick brass foundry at 1230-1234 Canal street, estimated to cost $90,000.

The Bridgeport Malleable Iron Co., Bridgeport, Conn., has let the contract for a one-story brick, concrete and steel structure, 48 x 139 feet, to be used as a power station at its plant on Railroad avenue.

The Union Steam Pump Co., Battle Creek, Mich., is planning an addition to its factory, 90 x 327 feet, two stories, of brick, steel and cement. The company advises that it will purchase from time to time whatever machinery equipment it needs, continuing as it has to build steam power pumps, air compressors, condensers and machinery along this line. The company is also completing a new office, 50 x 65 feet, three stories.

The East Moline Brass Works, Moline, Ill., has been projected by E. J. Friedesley, and construction work on the foundry 40 x 44 feet, with an ell extension, has been begun. The foundry will be ready for occupancy July 1.

The Imperial Brass Co., Chicago, has purchased the property at the northwest corner of Center avenue and Harrison streets, 100 x 125 feet, on which it plans to locate a plant estimated to cost approximately $100,000.

North & Judd Mfg. Co., New Britain, Conn., has awarded contracts for additions to its plant. The plans call for an addition 60 x 105 feet to the brass foundry, and another 70 x 94 feet to the annealing department, both structures to be of brick.

Official announcement has been made that the C., H. & D. railroad has let the contract for a proposed $100,000 terminal roundhouse and machine shop for the company at Toledo, O. The building will be of brick with cement foundation, and construction will be commenced at once.

The stockholders of the Marshall Furnace Co., Marshall, Mich., have decided to increase the capital stock from $100,000 to $150,000. The increased capital will be used for the erection of additional shops, plans for which have been adopted, estimated to cost between $40,000 and $50,000.

The Walker & Pratt Mfg. Co., Watertown, Mass., builder of Crawford ranges and boilers and heaters, recently completed an addition to its plant, which will increase its capacity 33 1-3 per cent. The demand for the Crawford product has made it necessary to enlarge the plant four times in the past ten years.

French & Hecht, Davenport, Ia., have begun the construction of a new foundry of reinforced concrete, two stories, the main floor of which will afford 50,000 square feet of working space. One of the features of the foundry will be the strengthening of the second floor in order to provide for all the molding to be done on that floor.

The Brevier Gas Engine Co., with a capital stock of $100,000, is planning to build on a six acre tract at Kalamazoo, Mich. The first building will

be 40 x 125 feet. Beside this, a foundry and pattern shop will also be built. The company will manufacture gas engines designed by Henry Brevier, of Grand Rapids. Beside the designer, D. A. Shepardson and Jacob Gumbinsky are financially interested in the company.

The Canadian-American Gas & Gasoline Engine Co., Ltd., Dunnville, Ont., advising respecting some recently noted new construction, says that it is erecting a machine shop, 50 x 200 feet, a foundry 60 x 156 feet, and a blacksmith shop, 60 x 75 feet. All of its machinery equipment has been purchased, and the company expects its plant to be running about the middle of June. Its principal line of manufacture will be stationary, traction, gas, gasoline and oil engines, mostly for export.

The Excelsior Stove & Mfg. Co., Quincy, Ill., is erecting a brick and reinforced concrete fireproof pattern vault, six stories, 40 x 90 feet. The contract has been let to local builders. The company will shortly erect a warehouse at Oklahoma City, Okla., four stories, 100 x 140 feet. The plans for the Oklahoma building are now in the hands of architects, and correspondence relative to the structure should be addressed to the Quincy office.

The Gear Grinding & Machine Co., Detroit, has increased its capital stock from $200,000 to $300,000. It has planned to move in August into a new building, three stories, 65 x 100 feet, located at the corner of Chene street and the Boulevard. As soon as it is located in the new building, the company will begin the manufacture of gear grinding machines, in addition to the regular output of automobile transmissions and traction gears. The officers of the company are: President, E. M. Holland; vice president, F. A. Ward; secretary and treasurer, N. C. Banks.

Ground has been broken for the new plant of the Velie Engineering Co., Moline, Ill., on a site between Third and Fourth avenues east of Twenty-fifth street. The plans contemplate a building 80 x 100 feet, four stories, of reinforced concrete, similar to that of the Velie Motor Vehicle Co. The new company has secured sufficient ground for four buildings of the size mentioned, and it is expected that manufacturing operations will begin early in September. The company's plans this year contemplate the manufacture of motors for the Velie Motor Vehicle Co., for which all the machinery has been purchased for July delivery. The new plant has a capacity of 30 motors per day, and delivery to the motor car factory will be made by motor truck.

General Industrial:—

The Risdon Tool Co., which was recently incorporated, has organized by the election of these officers: President, W. L. Shepard; G. T. Wigmore, secretary and treasurer. The company will begin at once plans for a plant at Naugatuck, Conn.

The Rock Island Pulverizer Co., Rock Island, Ill., has been incorporated with a capital stock of $100,000, to do a general manufacturing business in mining and milling machinery. The incorporators are Robert Forsyth, Wallace W. Wiegand and W. G. Xander.

Sweet & Doyle Foundry & Machine Co., Troy, N. Y., advises that the fire damage sustained by its machine shop was small, the loss amounting to not over $500.

The Union Drawn Steel Co., Beaver Falls, Pa., has leased an old electric railway power house and will use it for storage and warehouse, as well as for some manufacturing purposes.

Fecheimer Steel & Iron Co., New York City, iron and steel broker, has leased from the Lehigh Valley railroad 11 acres at Allentown, Pa., to which it will remove its business.

The Briggs & Stratton Co., Milwaukee, Wis., has filed an amendment to its articles of incorporation with the secretary of state increasing its capital stock from $25,000 to $50,000.

An amendment to its articles of incorporation has been filed by the J. Massino Gas & Electric Fixture Mfg. Co., of Milwaukee, Wis., changing its name to the J. Massino Mfg. Co.

The city of Kent, O., has raised a fund of $50,000 required to retain at that place the plant of the Seneca Chain Co. The company will rebuild this summer the works destroyed by fire last fall.

The American Steel Foundries has purchased 14 properties adjoining the site of its Alliance, O., plant, and is planning to erect additional buildings that will double the capacity of the Alliance works.

The plant of the Empire State Engineering Co., Rome, N. Y., has been sold in seven separate parcels. The real estate sold for $11,587.50 to J. B. Wise, of Watertown, N. Y. The machinery went to various purchasers of the 506 lots in several eastern cities. The total sum realized was $28,450.

The directors of the Minneapolis Steel & Machinery Co., Minneapolis, Minn., have decided to increase its capital stock from $1,250,000 to $1,500,000. The name of George H. Christian was added to the board of directors. The company, it is understood, is planning an addition to its plant, including a plate mill.

The Superior Iron & Mfg. Co., Wauseon, O., advises respecting plans of the newly incorporated company, and says that its plant located at Wauseon has been placed in operation this week. It will employ 75 molders and 15 wood and metal pattern makers, its product being very light and small malleable iron castings and metal patterns. The construction of all of its buildings has been complete, and necessary machinery equipment has been purchased. The company's general offices are at Toledo, O.

The Beyster-Detroit Motor Car Co., Detroit, advises that it is having constructed an automobile factory in which commercial wagons will be built. Its car is designed for the use of department stores, laundries, grocers, etc., and is fitted with a four-cylinder vertical water-cooled engine, equipped with either solid or pneumatic tires, fitted throughout with electric lamps and body of either open or closed type. The transmission gear is of planetary type; both front and rear axles are drop forged, I-beam section. Roller bearings are used throughout the car. The company expects to turn out at least 500 cars during the next twelve months.

Trade Note:

Purdy & Henderson, constructing engineers, of New York, Chicago and Havana, have established an office at 1142 and 1143 Henry building, Seattle, Wash., with J. L. Hall, second vice president of the company, in charge.

Fires:—

The core shop of the new plant of the Detroit Valve & Fittings Co., Wyandotte, Mich., was badly damaged May 24, the loss being estimated at $2,000, covered by insurance.

The plant of the Cleveland Co-operative Stove Co., Cleveland, was badly damaged by fire, June 1, the loss being estimated at $50,000, covered by insurance. The plant covered three and one-fourth acres at East Sixty-seventh street and Central avenue. The fire originated in the boiler room shortly after quitting time and spread until the main building was badly damaged. The plant has just been rebuilt after having been damaged last year by a cyclone.

Fig. 1—Copper in Relief, Showing Segregated Lines of Oxide.

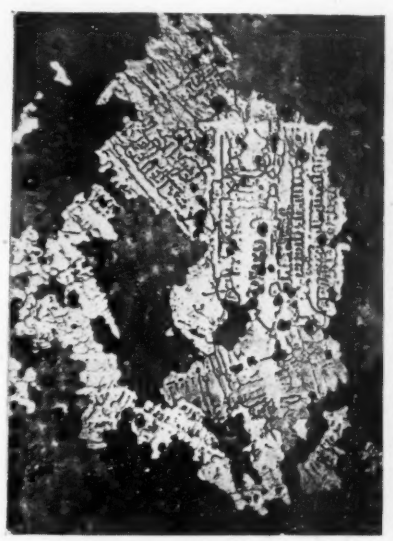


Fig. 2—Copper Etched with Ammonium Persulphate and Showing Lines of Segregated Oxide.

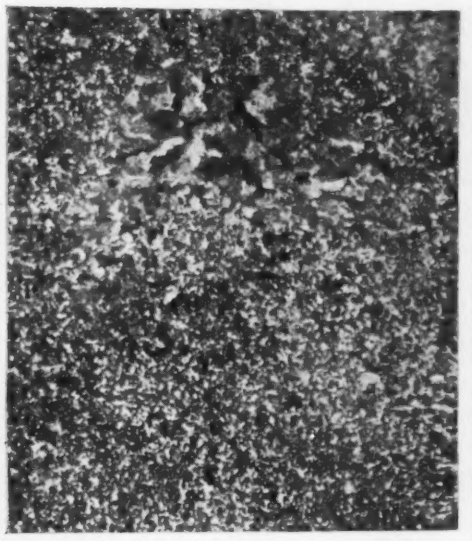


Fig. 3—Cross-Section of an Ingot of Copper Etched with Ammonium Persulphate.

Fig. 4—Copper Etched with Nitric Acid.

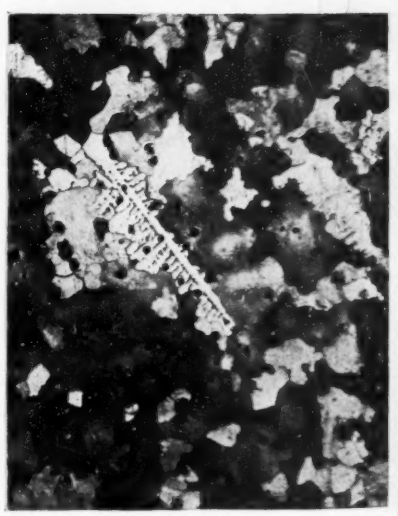


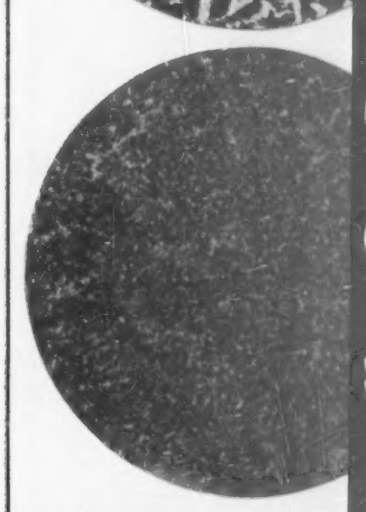
Fig. 5—Copper Etched with Ammonium Persulphate.

Fig. 6—Phosphide of Iron. Etched with Cupric Ammonium Chloride Followed by Nitric Acid.

Fig. 7—Phosphide of Iron After Law.

Fig. 9—Wrought Iron. Vertical Illumination.

Fig. 10—Wrought Iron. Oblique Illumination.



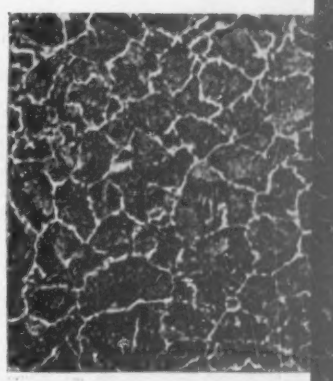


Fig. 11—Steel as

Fig. 13—Properly Ann

Fig. 16—Steel as

Fig. 17—Carbon Segrega Iron.

KODAK S·A

Ammonium
ng Lines
ide.

Ammonium

Vertical

Fig. 3—Cross-Section of an Ingot of Copper Etched with Ammonium Persulphate.

Fig. 6—Phosphide of Iron. Etched with Cupric Ammonium Chloride Followed by Nitric Acid.

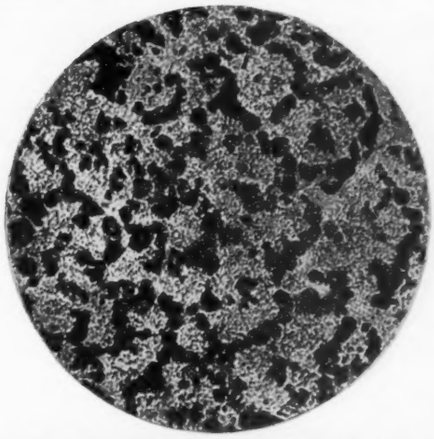
Fig. 10—Wrought Iron. Oblique Illumination.

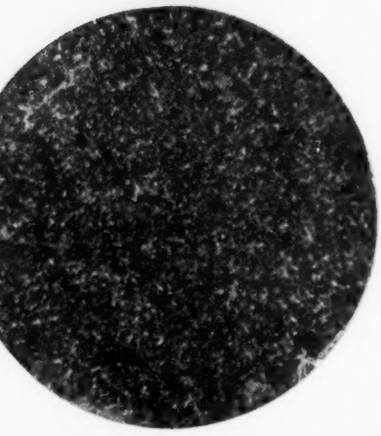
Fig

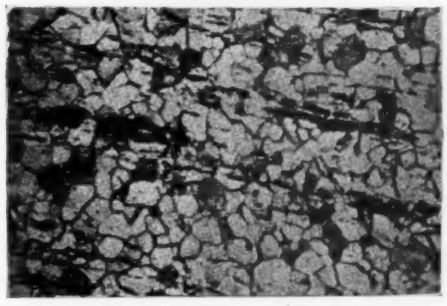
Fig. 13—

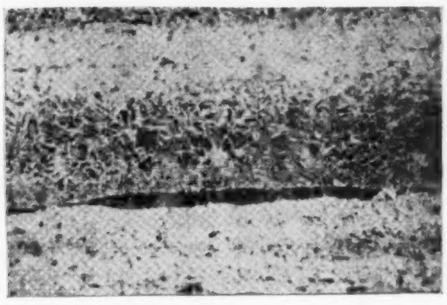
Fig.

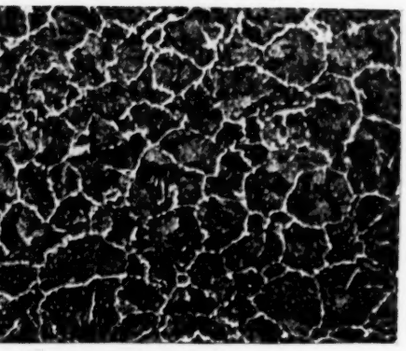
Fig. 17—Ca











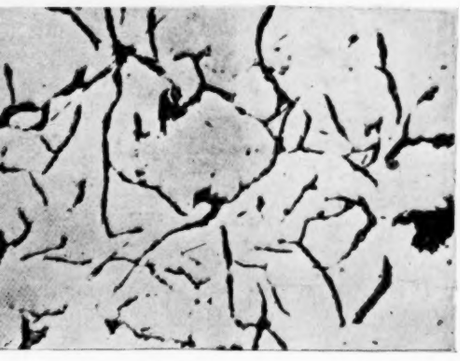


FIG. 11—STEEL AS CAST.

FIG. 12—IMPROPERLY ANNEALED STEEL.

FIG. 13—PROPERLY ANNEALED STEEL.

FIG. 14—WROUGHT IRON.

FIG. 16—STEEL AS ROLLED.

FIG. 15—CHARCOAL IRON.

FIG. 17—CARBON SEGREGATION IN CAST IRON.

FIG. 18—SLAG IN STEEL, POLISHED IN RELIEF.

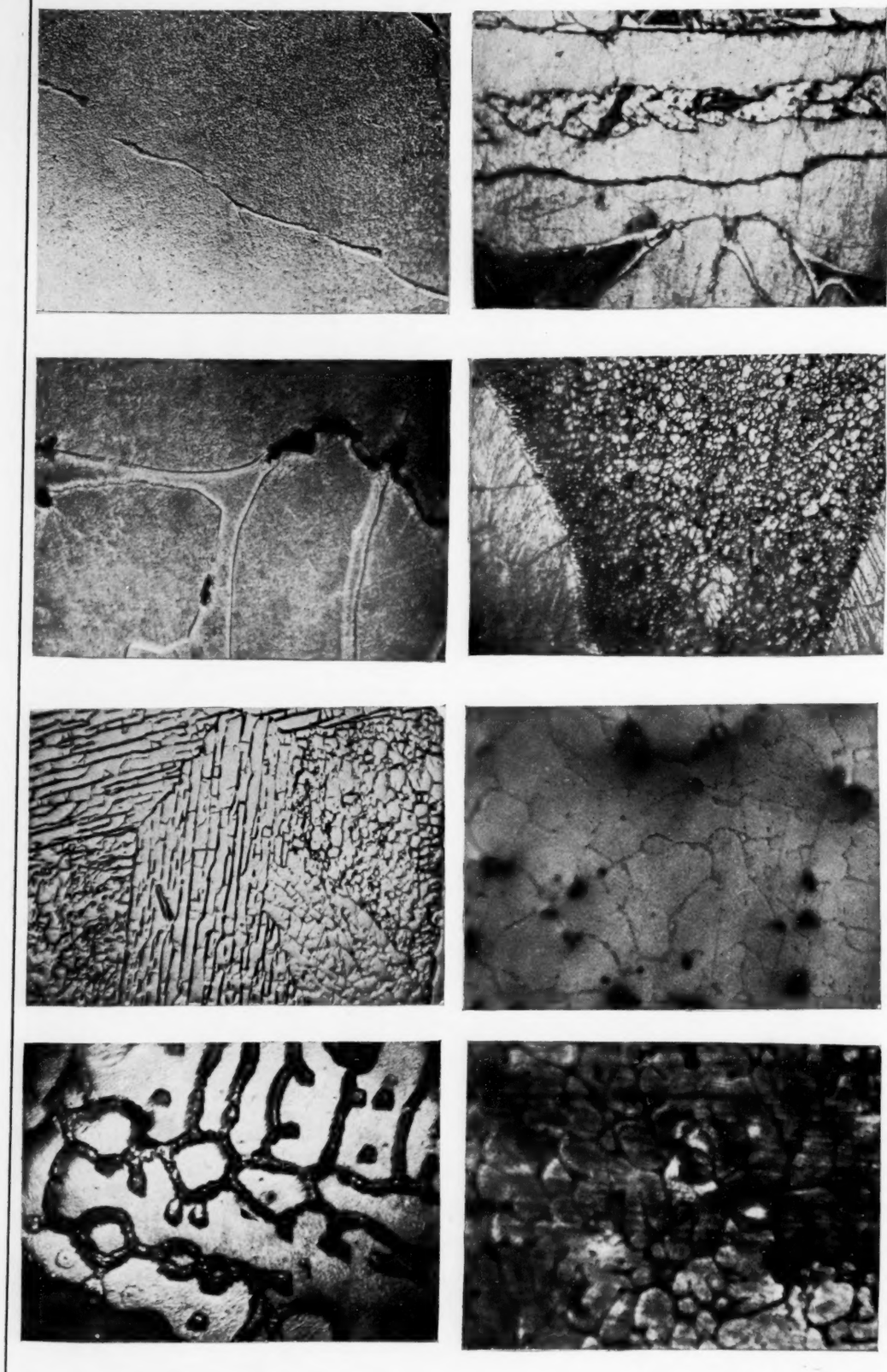


Fig. 19—Phosphide Segregation in Steel After Treating with Cupric Ammonium Chloride.

Fig. 20—The Same Segregation Greatly Magnified After a Further Etching with Nitric Acid.

Fig. 21—Sulphide Associated with Phosphide.

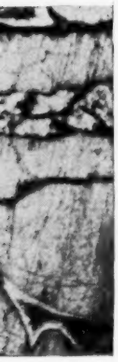
Fig. 22—Sulphide Enveloping the Grain.

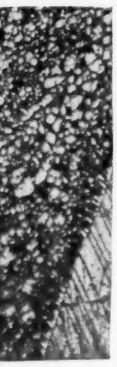
Fig. 23—Segregation in Nickel Steel.

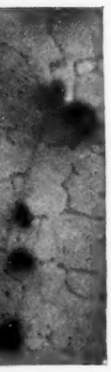
Fig. 24—Oxide in Copper, Polished in Relief.

Fig. 25—Same as Fig. 24, After Etching and at a Higher Magnification.

Fig. 26—Copper.



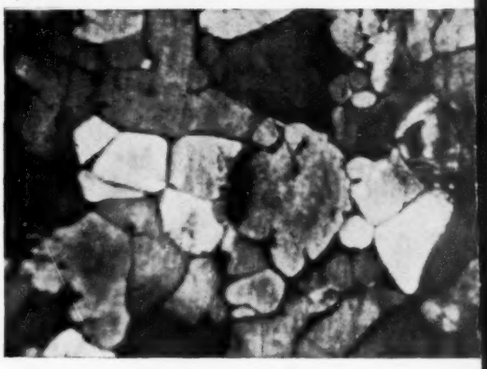


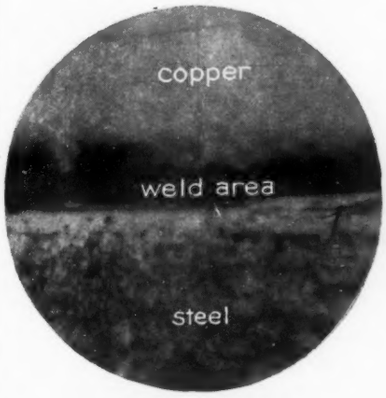


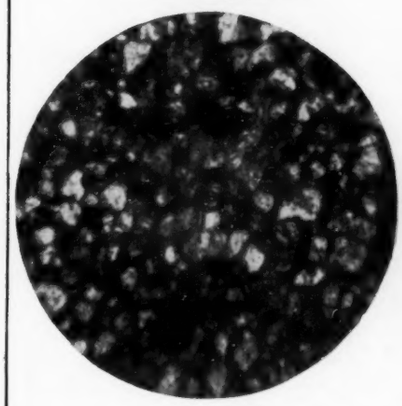
GREATLY
ETCH-

THE

HED IN







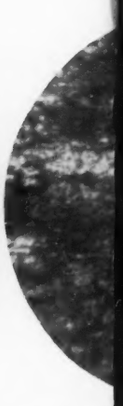


FIG. 27—COPPER.

FIG. 29—COPPER.

FIG. 31—A COPPER-CLAD ROD, THREE COMPOUNDS VISIBLE IN THE WELD AREA.

FIG. 34—BARE STEEL 3/8-INCH ROD, CROSS-SECTION.

FIG. 32—C
C

FIG. 35—S
ROD,

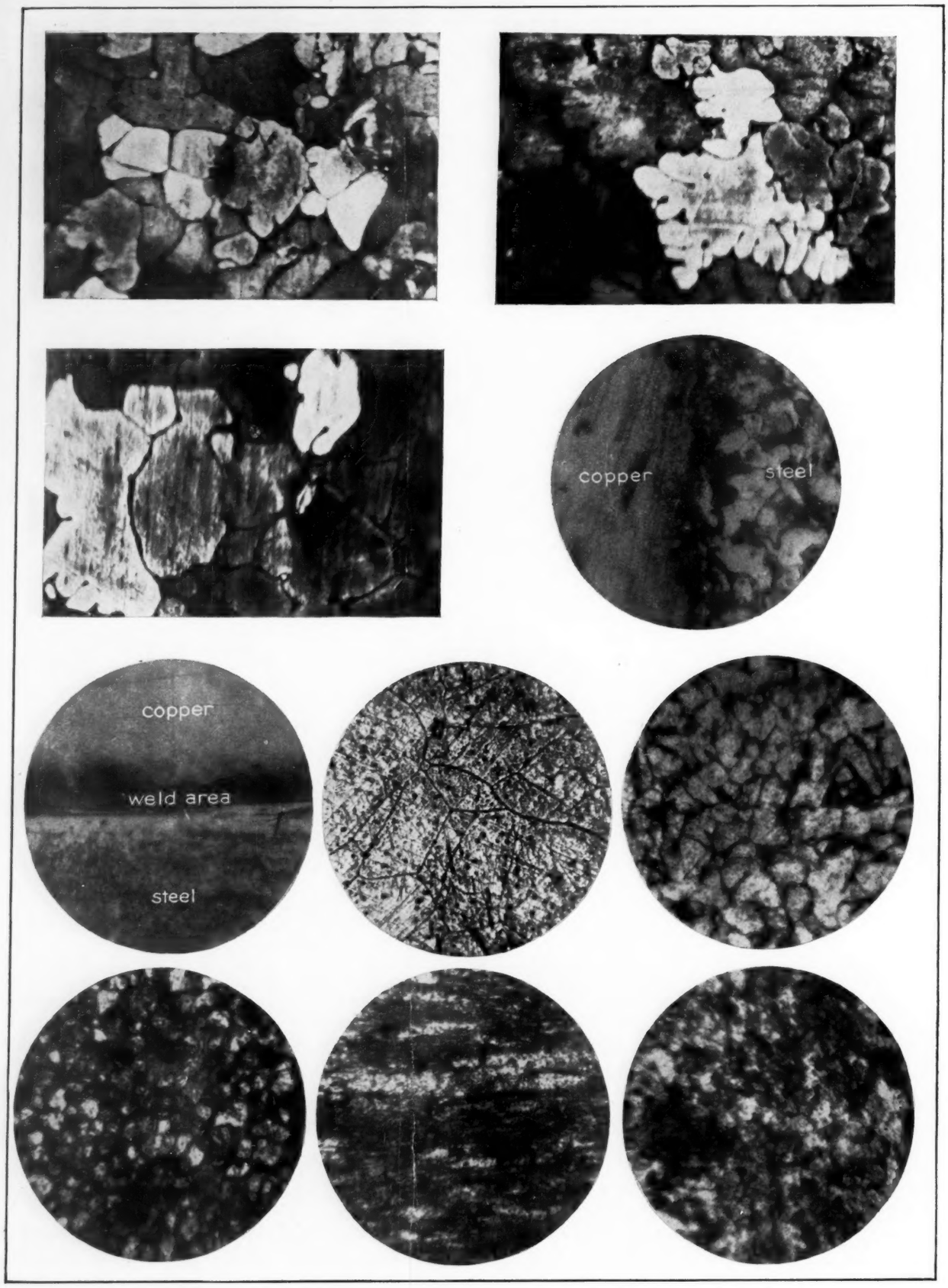


FIG. 27—COPPER.

FIG. 28—COPPER.

FIG. 29—COPPER.

FIG. 30—CROSS-SECTION OF A 3-13/16-INCH COPPER-CLAD BAR, SHOWING THE WELD AREA AND STRUCTURE OF THE STEEL.

FIG. 31—A COPPER-CLAD ROD, THREE COMPOUNDS VISIBLE IN THE WELD AREA.

FIG. 32—CUPRIDE OF IRON IN COPPER-CLAD STEEL. x 1530.

FIG. 33—BARE STEEL 3/8-INCH ROD, CROSS-SECTION.

FIG. 34—BARE STEEL 3/8-INCH ROD, CROSS-SECTION.

FIG. 35—STEEL IN COPPER-CLAD 3/8-INCH ROD, LONGITUDINAL SECTION.

FIG. 36—STEEL IN COPPER-CLAD 3/8-INCH ROD, CROSS-SECTION.